



**THE
TWENTIETH
LACUS
FORUM
1993**



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1993**

TOBY D. GRIFFEN
Series Editor

THE TWENTIETH LACUS FORUM 1993

edited by
Valerie Becker Makkai



LINGUISTIC ASSOCIATION OF CANADA AND THE UNITED STATES
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PREFACE

The Linguistic Association of Canada and the United States held its first Forum meeting at Lake Forest College, Lake Forest, Illinois, in August of 1974. Nineteen years later, the Twentieth LACUS Forum was held July 20-25, 1993, at the University of Illinois at Chicago. In the intervening years LACUS has achieved a stature and an acclaim that was hardly dreamed of in the minds of the organizers of that first Forum.

Annual Forum meetings have been held at twenty different colleges and universities across the United States and Canada, and the tables of contents of the resulting twenty volumes of proceedings of those conferences read like a who's who of linguistic scholarship. Some of the unknowns of the earlier volumes have gone on to make solid reputations for themselves, and LACUS can count among its members and Past Presidents many of the most eminent scholars of our day.

LACUS has a singular record of encouraging younger scholars in their efforts to advance in the field. In 1986, through a generous gift from LACUS Past President Kenneth L. Pike, a prize was awarded for the best paper presented at the Forum by a younger scholar. Thus began the tradition of the LACUS Presidents' Prizes. From 1986 through 1989 a single prize was awarded each year. Starting in 1990, two prizes have been awarded annually -- a Pre-Doctoral Prize to an author who has not yet completed the doctorate, and a Post-Doctoral Prize to an author who has completed a doctorate within the preceding ten years, but who has not yet achieved academic tenure. This year, for the first time, a third prize has been added. Through the generosity of an anonymous donor, the Robert J. Di Pietro Memorial Award will be given annually to a doctoral student or non-tenured Ph.D. whose Forum paper contributes the most to the advancement of research in the teaching or acquisition of second languages. These prizes have not only honored promising young scholars; they have also frequently contributed directly to the advancement of the awardee's careers through the public recognition of their talent by senior scholars in the field.

The current volume is a testimony to the diversity that is present at every LACUS Forum. The topics of papers run the gamut from "The Possibility of Language" to "Can Languages 'Disintegrate'?", from "Estonian Length and Moraic Analysis" to "Sex-Differentiation in English Usage", from "Shakespeare's Use of Metaphor" to "Linguistics in Library Classification Systems". Invited papers were presented by scholars with as differing theoretical viewpoints as Victor Yngve, Alan Melby, James McCawley and Sydney Lamb.

The outstanding papers presented at the conference by younger scholars are exemplified by the winners of the Presidents' Prizes and the Di Pietro Memorial Award. The Eighth Annual Presidents' Post-

Doctoral Prize was awarded to Victor Boucher of the University of Windsor, Ontario, for his paper "On the Primacy of Cognitive, Socio-Interactive, or Genetic Factors in Explaining Language Development". Harry Bego from Tilburg University in The Netherlands received the Fourth Annual Presidents' Pre-Doctoral Prize for "A Context Change Model of Feedback Acts". His paper also received a Commendation from the Di Pietro Award Committee. The First Robert J. Di Pietro Memorial Award was conferred on Lori Morris of the University of Quebec at Chicoutimi for her treatment of "This, That and the Other Thing: Spatial Representation in the English Demonstratives and the Third Person Singular Inanimate Pronoun". In addition to these award winners, Dan Myers of The Union Institute received both a Presidents' Post-Doctoral Commendation and a Di Pietro Award Commendation for his paper "Using Prototype Theory to Understand the Concept of Bound Morphemes in Chinese", and Toshiyuki Kumashiro of the University of California, San Diego, received a Presidents' Pre-Doctoral Commendation for "How the Goal can be the Source: The Semantics of the Japanese Dative Marker *Ni*". We congratulate these fine young scholars and expect to hear much more from them in the years to come.

Those who were in attendance at the Twentieth Forum know that James Copeland was unable to attend or to give his Presidential Address due to back surgery. Thus it is with particular pleasure that we print his intended Presidential Address here as the first paper in Section I of this volume, followed by the invited lectures and the prize winning papers. The remaining papers are grouped by topic, as much as is possible, in sections 2 through 12. Their arrangement is, by necessity, somewhat arbitrary since many papers could have easily fit into more than one topic.

After serving for twenty years as LACUS Secretary-Treasurer and Coordinating Editor, as well as annual conference coordinator, and having overseen the coming of age of the organization, I have turned over the reins of my job to others. In the twenty years since its founding by a small group of scholars who felt they needed a different forum for their ideas than was then available, LACUS has grown into a large international organization with members in some 50 countries. Each year scholars come from around the world to hear and present papers on a wide range of diverse subjects, finding, as they do, that they have much to learn from each other. One of the things that members of LACUS can be proudest of is our willingness to listen to viewpoints different from our own. The spirit of friendliness and tolerance that pervades a LACUS meeting is one of the organization's most unique and enduring aspects. I have every confidence that LACUS will continue to be a moving force in linguistics for generations to come.

Valerie Becker Makkai

I
SPECIAL LECTURES

1993 PRESIDENTIAL ADDRESS

Variation and Constancy of Patterning in Language and Culture: the case of Tarahumara

James E. Copeland
Rice University

The following is a version of the creation story of the **Rarámuri** Indians who live in a remote area of the Sierra Madre in Northern Mexico (cf. Merrill 1988:93-94). It introduces a concept that is central to Tarahumara theoretical knowledge about the nature of the universe, namely the concept of souls.

*It happened one day that the Sun God and his older brother, the devil, were sitting together talking, when they decided to see which one could create human beings. God began with fine clay, while the devil mixed in white ashes with his clay. They began by shaping clay figurines. They decided to fire them to make them hard. God's figurines were dark brown; the devil's figurines were lighter in color. But the dolls did not move. God blew his breath into his dolls and they came to life. These became the Rarámuri people. The Devil tried to blow life into his dolls, but he had no success. So he asked God, "how did you do that?" And God taught the devil to breathe souls into his creations. And they became the other peoples of the earth. When the devil saw that the Rarámuri were the children of God, he called for a *rarahipa* between the peoples (a race in which the men run and kick a wooden ball along a course). The devil's children won the race and were rewarded with the spoils of the wager, becoming rich. This is the reason the Rarámuri are very poor.*

Since the early 1600s these people have been called **Tarahumaras** by the outsiders, but they refer to themselves as the **Rarámuri**. Because of their widely known prowess as runners, the name is assumed to derive from **rará**, 'sole of the foot + **ma-ri**, 'runner', i.e. 'footracer', but I would support the suggestion of other scholars (cf. Burgess 1982) that it is, instead, from **ra-** in **raénari** 'sun', thus signifying 'children of the Sun God'. The term **Rarámuri** refers by context to a number of distinct oppositions: a **Rarámuri** is a **human being** as opposed to a **nonhuman**; an **Amerindian** as against a **non-Indian person**; a **Tarahumara Indian** as opposed to a member of **another Indian tribe**; and finally a **Rarámuri man** as opposed to a **Rarámuri woman**.

The homeland of the Tarahumara begins some 300 miles south of the New Mexico/Arizona border in the state of Chihuahua. There are currently about 60,000 speakers living in an area of some 40,000 square kilometers. The rugged mountainous country is drained by two river systems forming deep gorges, one on either side of the continental divide. The Mexican name for the most rugged part of the sierra on the western slope is the

Barranca del Cobre. It has often been compared with the Grand Canyon far to the North as a place of spectacular beauty.

But the Sierra Tarahumara region is thickly populated in contrast to the Grand Canyon. Indian households, interconnected by an extensive network of footpaths, are distributed throughout the entire region. Considerable dialectal variation is apparent in the region, but mutual intelligibility is high, and it is clear that there is one Tarahumara language and one culture. The area that I will be talking about is located on the east side of the continental divide along the canyons that drain the Sierra Madre into the Rio Concho and then further northeast into the Rio Grande on its way to the Gulf of Mexico.

My field work on this language during the last several years has caused me to radically rethink some of the basic theoretical notions in our discipline. Particularly, I have in mind the expectation of integrity and discreteness of linguistic forms, as well as the expectation of homogeneity in the design of a language. Structural linguistics of almost any mold, including both generative and non-generative models, has tacitly if not explicitly maintained the notion that linguistic structure consists essentially of discoverable finite inventories of elements and their patterns of interrelation. This is true at least in practice if not in theory. Thus for most of twentieth century linguistics a grammar of a language consists of discrete inventories of phonemes and morphemes, that are strictly rule-governed in their phonotactic and their morphosyntactic patterning. In phonology, the shape of a morpheme is constant, absent conditioned and internally motivated autosegmental or morphophonemic alternations. In practice this has meant that the task of a linguist is to collect the fragments of linguistic data in the form of utterances, and produce in the end an essentially coherent picture of the language as a homogeneous object with little residue or functionally unmotivated variation in its phonological and grammatical systems.

But Tarahumara does not fit. I have previously reported to LACUS on the widespread unmotivated variation in the shapes of Tarahumara words and morphemes, that was so puzzling to me when I began a study of this language a number of years ago (Copeland 1991, 1994). I will not be able to repeat those data here in detail, but I will reiterate that Tarahumara words and forms in spoken texts most often show a variable number of possible 'phonemic' shapes. We will have a look at some of these in a moment. The alternations are similar in kind to so-called free alternations like *economics/economics* or *roof/roof* in English, but they are much more immediately apparent in Tarahumara speech. They also involve a much larger array of phonetic dimensions than the free alternations of English. These alternations in English have been discussed in the literature under

the rubric of sociolinguistic phenomena, and as such they are shunted aside as exceptions to 'real' grammar, or as residue. Operating within the conventions for demonstrating audible contrast, we can find large numbers of decontextualized minimal pairs in Tarahumara that will demonstrate the phonemic status of /h/ and /ʔ/, glottal stop, as over against zero in sets like /ohkó/ 'pine', /o'kó/ 'suffer' and /okó/ bird species. Similarly contrasts for /p/ vs /b/ vs /m/, etc., until the obligatory phonemic inventory emerges as a result of the exhaustive application of the procedure. But then even a cursory examination of spoken texts transcribed using the phonemes established in that way, will show a widespread free substitutability phenomenon in Tarahumara morphemic phonology. Take now a brief look in the texts below at the darkened forms, for example in items (46), (50), and (52), where **pahcá** = **bahcá** = **pacá**; or in items (29), (45), and (49), where **pinó** = **binó** = **minó**. etc., etc. There is no phonological, morphosyntactic, or semantic motivation for these alternations between sets of phonemic shapes. And yet they are so pervasive across the culture, from speaker to speaker, that they must be considered to be a central feature of the language. There is thus no cognitive requirement for logically consistent **sound patterning** in Tarahumara grammar, that is based solely on the principle of audibility of binary contrast. The sounds of Tarahumara often function on continua of sound variation that are operative on specific phonetic dimensions in context. These gradations of sound do not correlate well with the atomic building blocks of leading current phonological theories of language. But the fluctuating phonetic values function perfectly well, because they occur in the specific contexts of the discourse that they are a part of. Figure 1. graphically summarizes the phonetic gradations of the major free alternations of this type that I have identified in Tarahumara texts. The phonetic facts are confirmed by the data of other linguists who have worked on Tarahumara.

Likewise in the **morphology** there is a great deal of individual freedom in the choice of bound forms and functors for expressing specific grammatical and semantic functions. In the **syntax**, the word order in Tarahumara spoken texts is highly variable and free. All of these types of phonological and grammatical variation occur within the speech of individual Tarahumaras, and also show lack of linguistic regimentation in the group.

Speakers in all but the most front-line Rarámuri communities are non-literate, and many, to varying degrees, have been bilingual in Spanish for a number of generations. The absence of literacy among the Tarahumaras means that they lack a metalanguage that is based on visual metaphor. In fact there is very little conscious metalanguage of any sort in Tarahumara that would indicate overt abstract awareness of linguistic form. There are no language police, no linguistic catechism. Children learn by observation of speech in context and by imitation. "Mistakes" or what a prescriptivist

would see as grammar deviations are never corrected by adults as against some readily available standard. This lack of a conscious metalinguistic standard may also call into question the expected presence of a well-defined body of covert knowledge of homogeneous grammar in the culture.

Notwithstanding this apparent lack of overt abstract knowledge of grammar, and the high degree of tolerance for variation in form that it facilitates, the Tarahumaras demonstrate an acute awareness of the concrete sounds that occur in their environment. For example there are only a couple of nominalized forms, **ra'íca-ra**, from **ra'íca-ma**, and **ne'ó-ga-ra**, from **ne'o-ma**, both meaning 'to speak', that can express abstractions like what we would refer to as a **word, utterance, speech, discourse, and/or language**. But there are an almost unlimited number of words available for expressing the rich array of concrete sounds in nature, including of course human sounds. The suffixes **-cane** and **-aní**, both grammaticalized reduced forms of verbs of saying, are productive in their use with other forms that either imitate sounds of nature like **roró-aní**, 'to bellow', 'to grunt', or 'cough', or **nará-cane**, 'to bleat' or 'to cry', **gusú-cane**, 'to crow'; or forms for objects like in 'water-say' in **ba'wí-cane**, 'to babble', as in brook, or as in 'rain-say' **ukú-cane**, 'to thunder' or 'to storm'. Expressions for any object or phenomenon that can either have or make a characteristic sound can be readily coined in this way.

What I want to do now is to present a range of features of Tarahumara culture, all of which show patterns of inconsistency and **variation**, and to suggest that these cultural systems of knowledge, specifically the **c o s m o l o g y**, perhaps furnish a better metaphor for understanding the cognitive organization of language than does a metaphor that models language (or a grammar of a language) as an autonomous finite device that is essentially logical and separable in kind from other cognitive phenomena.

First, I want to show you some film of the **Rarámuri** people so that you can have a better idea of their physical appearance, everyday living conditions, and also of the sounds of their language. And then, later on, I will introduce additional scenes and discourses in order to illustrate specific aspects of the culture that I want to mention. The film presents the **Tuciaci** landscape, showing Tarahumara caves, shelters, and houses. You will notice a wide range of variation in the shapes and in the materials used in the built forms of living spaces; no two are the same. **Rakirín Goosare** mentions this variation in the beginning of his description of life in the mountains (items (1) - (10), below. The film also presents a bird'seye view of Tarahumara family life, child rearing practices, and conversation around the fire. In addition to variation in architecture, the film shows lack of uniformity in many other artifacts of the culture as well; ceramic pots, plows, tools, baskets, metates, etc.

Text: 'How the Rarámuri Live up in the Mountains
February 21, 1992, Recorded on video
by Rakirín Goosáre from Tuciaci

Jim:

- (1) *piri - beh-te-ke - rarámuri miká siera - rasiera ba*
how live rarámuri back home mountains junc
How do the Tarahumaras live up in the mountains, where you are from?

Rakirín:

- (2) *pe reso-ci haré garí-riri peré haré kanó-a-ci haré - pe keporí*
well cave-loc other house-loc live/pl other wood planks-loc other shrub
Well, in caves; some live in houses; others in wooden teepees; others live in brush
- (3) *uca-gá pere-am pa nehe-ko an ga'rá garí-riri beh-té pa*
live-stat live/pl-stat junc I- pos good house-loc live junc
structures, in shelters made of bushes; I live comfortably in a house

Jim:

- (4) *pe tata 'niara an acó*
father poss also
And your father?

Rakirín:

- (5) *aena co reso-ci peré haré haré pe kanó-a-ci peré haré nehé ké hare-co newa-re*
yes also cave-loc live/pl other but board-loc live/pl other I neg other make-perf
Yes, he too. others live in caves; others live in wooden shelters - I didn't -
- (6) *newa-re hare-co reso-ci peré haré - haré pe čihko-ci gé peré garí-riri haré*
make-perf other cave-loc live pl other but corner-loc pp live/pl house-loc other
someone else made it; others in caves; live in rock shelters; some in houses
- (7) *pe care-ci peré hare-ko haré gomici gé haré epó gé peré haré apo 'wé risóati*
but brush-loc live/pl other canyon pp other plain pp live/pl other rel very poor
but others live in brush enclosures; still others in canyons, others on the plains, those
- (8) *huku apu ke ma'ci-ko newá garí pa ma ocer-am go ma ne maci newá garí*
be rel neg know- make house junc now old-stat now I know make house
that are very poor and don't know how to - old people - I myself know how to
- (9) *suhpánari uga ho-ka we'é re'é mi'ci-ka tihpu-ra-ti mi'ci-ka pe ci'ti rihpu-rá sinéoma*
mud with dig- earth stones hack- axe-inst strike- but dull axe-poss all
make a house with mud - I dig up dirt, carve the stones with an axe, a very old axe -
- (10) *nurá newá-nura suná nihi-nare apo nehé ko'-mea muni suná 'rina bahcá upa-ko ...*
need make-caus corn give-desid rel I eat-fut bean corn down inside then ...
we all need to make a shelter - to be able to store corn in, so we can eat - store ...

In addition to exhibiting fluctuation and lack of constancy in many aspects of their material culture, the Tarahumaras also disagree widely about the details of their explanatory models for everyday experiences like dreaming,

inebriation, sleep, illness and death.

COSMOLOGY

Tarahumaras thus hold widely different views in their conceptualization of the universe and their place in it. I will now describe aspects of their theoretical knowledge in some detail; concentrating on the one hand on the underlying cosmological system **shared** by the majority of the people, and on the other hand on the high degree of **diversity** of religious belief within the culture. It is the variation in the details of the cosmology that will command our primary attention.

Most all of the world's religions are similar in that they attempt to reconcile life's contradictions, the paradoxes that include such basic oppositions as good and evil, life and death, happiness and misfortune. But the way in which the Rarámuri world view structures the answers to these questions, while apparently serving them well for many centuries, was deprecated by the conquering Europeans. The newcomers, the Jesuit missionaries, arrived in the area of the Sierra Madre shortly after 1600 with a commission to christianize the native peoples. They established missions and attempted to congregate the Indians into settlements, each with a church at its center. In some areas resettlement partially succeeded, at least for a time. Where they did succeed, the traditional ecological distribution of households across the region was disrupted in favor of centralized villages, that were now dependent upon the missionaries for survival. This centralization was intended to facilitate the attack on the native cultural patterns. But most of the Rarámuri soon rejected the changes and reverted to their own traditional pattern of living in isolated households.

As happened elsewhere, the European priests met with considerable resistance from the Tarahumaras. Under the pressures of religious acculturation from the outsiders, the Indians resorted mostly to superficial submission, and other forms of stoic resistance. As a practical solution to the problems of acceptance, the priests took catholic ritual, added in some European folk beliefs and dances, like the medieval European *Matachín*, and created a modified religious doctrine that they thought the Tarahumaras would accept and understand on their own terms. The Rarámuri, in turn, interpreted this system of beliefs, modifying the religious festivals and ceremonies as they saw fit. When the King expelled the Jesuits from this part of New Spain in 1767, the Rarámuri, were again left on their own to further fashion the rituals and beliefs that they had adopted from the missions, reforming them to conform to their aboriginal belief system. Thus the preservation of the integrity of their cosmology remained largely in the control of the Rarámuri themselves. Despite the incorporation of elements of the European culture the Rarámuri are considered to be

among the most conservative of Meso-American cultures. Both the baptized and the non-baptized Tarahumaras believe that their system of knowledge was communicated to their ancestors directly by the the Sun God, when the world was in its beginnings.

In Rarámuri culture there are two primary manifestations of religious belief and practice: The first is observable in the day by day behavior of the individuals themselves. Let's call it the **everday cosmology** (cf. Merrill 1988). It shapes and guides the activity of the people. The second manifestation is evident in the **nawesa**, public speeches, made by the shaman at social gatherings and religious ceremonies. Each public occasion when the people come together, whether to consult about some matter, or to perform their dances and ceremonies, the cacique delivers a public speech. These ritual speeches by the **siríame** are improvised on the spot, but they have a structured content of recurrent themes and a standardized manner of presentation. The language is reduced and stylized, and the speeches are delivered in a monotone at a very rapid pace. They show a restricted range of grammatical forms and gestural patterns. At intervals during the sermons, the men in the audience shout **iwérasa!**, 'be strong!' in an expression of support and approval.

I will illustrate two versions of this genre on film; one is by Ramón, **o'rúra siríame** in the region of Bakiaci, and the other is by Piriana, **pahcabé siríame**, a local cantor in the valley of Tuciaci. The first is delivered at the normal rapid pace that characterizes these speeches and the second is spoken more slowly, by request, but it still retains the mutated intonation.

There is a residue of Christian influence in these sermons, but the origin is probably indigenous, as is the thematic content. Central figures like Jesus are never mentioned; there is no mention of the trinity, no redemption through the crucifixion, no otherworld orientation, and nothing about the Tarahumara concept of souls. On several occasions I have observed and recorded these speeches. Three major themes always recur: (1) The first addresses the relation between the Rarámuri and the deities. Only three kinds of beings appear in the speeches: humans (Rarámuri), the cosmic parental family of the Rarámuri (Father Sun and Mother Moon with their children, the Stars), and the Devil. God is referred to as the **onorúame**, (Great Father), or **pañina behtëame**, (the-one-who-lives-up-there) and his wife is referred to as the **éera**, (Mother), and their children, **ta towí/ta tewé/kuci**. The speaker always invokes the protection of the deities in his speech, and reminds them that God himself also suffers when they behave badly. Thanks is given to God for his care. (2) The second major theme concerns the relations within Rarámuri society. The speaker admonishes

the people to respect their leaders and not to fight when they drink together. He reminds the leaders to guide, help, and provide for the well being of the members of the community. (3) The third theme of the public speeches concerns the approach of Rarámuri toward life, urging them to be cooperative and peaceful with each other. It is this-worldly; there are no references to the afterlife. The speaker exhorts the people and encourages them to live a vigorous life; to be strong and above all to avoid being sad, **o'mona/siwema**, lazy, **nasinákuri**, or embarrassed, **periwérusi**.

The **everyday cosmology** is by contrast much richer in scope and much more pervaded by beings and spirits than are the ritualized sermons. Both of these religious manifestations present a pantheon in which God and his wife live above the earth, and the devil and his wife live below. The universe is most often seen as being layered, with an equal number of worlds, perhaps three, above the earth and below it. The people have differing ideas about the number of worlds in the universe. Each level except the highest is said to be populated by people that work their way up the ladder of worlds on their way to live with the deities. The present world of the **ga'wí**, or mountain is the middle stratum. For the Rarámuri the Good is up and the Evil is down; but this arrangement is exactly the opposite for the other peoples of the world.

The **everyday cosmology** includes all of the themes and beings that appear in the speeches -- and in addition many beings that are excluded from the speeches: malevolent beings, the devil's allies, that live in the water, under the rocks, or in the woods. Their names are, for example **ba'wi-cí peré-ame** (water dwellers), **gonomí** (rainbows), **wipiwiri** (whirlwinds), and **basací** (coyotes). Some of these beings are said to be souls of the dead. There are other evil beings that are human: the **suhkurúame** (sorcerers), who have power to send evil birds, the **oremá/koremá**, who may appear as shooting stars (cf. items (61) - (64), below). They sit up in the sky or fly about at night, swooping down and causing illness or stealing the souls of the Rarámuri and bringing death. As can be seen in the film, the Rarámuri living space is often surrounded by barriers and poles decorated with dangling bones, skins and other totem objects that have the power to ward off evil spirits and protect the family at night.

The concept of the spirit or soul is central to the Rarámuri view of the world. Human beings consist of **amarúame**, a 'body', (a conglomerate of, **wihci-ra** 'skin'; **sa'pá-ra** 'flesh, **o'ci-ra** 'bone, **la-ka** 'blood), and a plurality of spirits. The most frequently encountered Rarámuri expressions for souls have to do with breath or wind and include **arewá** (life, breath), or **iwi-gá** (from **iwi-ma**, to breathe). The wind (**wehká**) is considered to be a being, a soul without a body. Another word frequently used to refer to souls is **károwa-ra** (shadow). The overriding metaphor is an inanimate container

and its occupants; the souls live in and care for the inside of the person, and the outside is in the care of the **panina behtëame**, 'the-one-who-lives-up-there'.

SOULS

Rakirín Goosari:

- (11) *hana-gó pe kari kam pa*
this conj house be junc
this (body) is just a house
- (12) *tamuhé ici ná uwa pe károara kaci ancó kam co pa*
we demo - with but shadow while also be too junc
we ... but we also have spirits at the same time
- (13) *ehká arewa-ka peré-ria rae mi pacá amariúame*
many soul- live/pl Dub there inside body
there are many souls that live inside the body
- (14) *mi pahcá 'nina ga'rá mociam pa omeru noká-nare rae*
there inside indeed good sit/pl junc be able move/pl-desid Dub
they live comfortably inside (the body) and can move it when they want to
- (15) *mo'o-cí ahti 'nátare arewá mo'o-cí sura-cí bireco o'ru-ra arewá behtë*
head-loc sit thinking soul head-loc heart-loc other- big soul live
In the head is where the thinking soul lives and in the heart the other large soul lives
- (16) *apua'ri muká ma okwániga ku-simí re'pá apu onorúame ahti*
when die now both return up where Father be/sit
when we die then the two of them go up to where the Great Father is
- (17) *kari-ra sura-ra ma'cina-ma mi re'pá ena apu onorúame behtë*
house-poss heart-poss leave-fut there up go where Father live
from its place in the heart (the spirit) will depart to go up where the Great Father lives
- (18) *pe hareco kari-ra rihpi-sa simíba-ré mi pacá wihcí tihpi-re*
but other house remain- do-perf-mod there inside skin remain-perf
but the other spirits stay in their places here inside the body
- (19) *ana'í amariúame rihpi-re tó-tu-ga*
here collective remain-perf bury-pass-stat
(they) will remain buried here together (in the body).

It is the responsibility of the souls to move the body and its parts, to provide warmth, give the body force, **iwéame**, and strength, **bewárame**, and to conduct all of the thinking and intelligent behavior of the person, **'náteri**. The belief in souls is a constant in Rarámuri culture, but there is wide

variation in the views of individual Tarahumaras about the number and function of a person's spirits and about the relationship of a person's souls to each other. Many Tarahumaras believe that all other animate beings have souls as well. Some disagree and others are not sure. Some will say on occasion that a moth has a soul, and then also maintain that moths are manifestations of the souls of other persons who have died and returned from a higher world. Tarahumaras who have had more constant exposure to Christian influences tend to believe that a person has only ONE soul. It flows to all portions of the body, and moves the parts. It does all of the thinking and feeling. During dreaming a portion of the soul leaves the body, but most of the soul remains behind. And if the entire soul leaves, the person dies. Most Tarahumaras believe that they have MANY souls and that they are distributed throughout the body. Some believe that the male Rarámuri have three souls and the females have four. One of the two largest souls lives in the head, the other in the chest or heart. The soul in the head is responsible for vigor, thought, and speech, and the soul in the chest is responsible for the emotions. There are many smaller souls. The major function of the little souls is to move the various parts of the body; Rimihio, one of my Tarahumara teachers believes that every moving part, e.g. every finger joint, has its own soul. This view accords with the generally held notion that all movement of any kind is caused by spirit activity.

The soul concept provides the Tarahumaras with a unified framework for understanding common experiences of life, like illness and death, sleeping, dreaming, and inebriation. It enables the Rarámuri to explain the normal existential states of the body as well as its altered states. Normal conditions of a person are being: **alive, awake, sober, and healthy**. Mutated states include **sleeping, dreaming, intoxication, illness, and death**. All mutant states are the results of change in the location, the condition, or the activities of a persons souls.

SLEEP AND DREAMS

While the Rarámuri agree that sleep is the result of the activity of a person's souls, there is widespread lack of consensus on the specific details. Most believe that when some or all of the souls get tired and begin to fall asleep, the person's body goes to sleep. The souls often remain inside the body to sleep, but they sometimes wake up and begin to think. And when they wake up inside the body the person begins to dream. The big souls often leave the body while the body is asleep to go on a journey. Some think that the souls can take on other animate forms, **nahítuame**, and move/fly about during the night. All agree that the souls are in the most danger when they are outside the body. If the big souls leave the proximity of the body for too long and do not find their way back, the person will become ill and perhaps die. Some informants believe that dreaming takes

place only when the souls travel outside the body (cf. Merrill 1988). The Rarámuri place great importance on dreams. Family members or visitors can expect to be asked at breakfast around the fire about the dreams they experienced during the night. The Rarámuri that dream well are respected as being very good thinkers, and very wise, 'we **nátame**.

DRINKING AND INTOXICATION

The Rarámuri frequently make thick alcoholic beverages out of various plants, but mostly out of corn (**sugí** or **sunú batari**), for use in their religious and social ceremonies and for encouraging neighbors to help in work activities that demand communal effort. Such work includes major tasks like planting, harvesting, fence building, etc. All such communal work is accompanied by the drinking of this beverage. In order to participate, a person must be invited to the occasion, **bahurérema**, and must partake in the communal religious or work activity. Attendance is limited mostly to people in the immediate valleys, but strangers from further afar find it easy to secure an invitation.

The corn drink has a strong smell and taste. It is drunk out of a large gourd that has been cut in half and dried. The liquid is fermented for about four days before it is ready to drink, and even so it remains quite green and continues to ferment even after it is imbibed. It quickly produces a state of intoxication that increases in intensity as the event or ceremony progresses. The normally quite reserved and taciturn Indians behave with much less inhibition when drinking. They become loud and talkative. They socialize much more easily, and maintain a decreased sense of personal space. At times there is even open belligerence. Open fighting at these occasions is frequent and serious enough to deserve special thematic mention in the public speeches of the **siríame**.

As can be seen in the film sequence, an **o'ró bahi-bo**, 'drinking party' is a very festive occasion in the upper region of the Tuciaci valley. The earliest reports by the Jesuits indicate that this practice of communal drinking is very old in the culture, and has been a constant frustration for the missionaries. Early in the seventeenth century strong opposition to the practice resulted in a massacre of ten priests by the Rarámuri and the neighboring Tepehuanes. The Rarámuri themselves are very proud of the drinking tradition, and they frequently emphasize to me that it is one of the defining features of being Rarámuri. The practice also figures informally in puberty rites, helping to indicate that a boy has become a man. The women drink, too, but contrary to the men, who all partake in the drinking, there are women who admit that they do not like batari and do not drink very much. One woman explained to me that she was a woman and did not have to drink. Other women drink -- and become belligerent -- just as do

the men.

Notions about drinking are widely divergent, but the most widely held **model of intoxication** goes like this: The large soul in the head does not like the smell or the taste of the brew. As a person begins to drink, the soul leaves the body, staying close for a while, but getting further and further away as the drinking proceeds. Soon the other big soul abandons the imbibing body as well, leaving the body in charge of the little souls who are like children. They can't think or talk very well, and they can not move the body as skillfully as the bigger souls do.

According to one variation of this model of inebriation, the larger souls in fact become intoxicated from the batari and wander off, so that they are actually drunk outside the body. If they do not find their way back, the intoxicated person will become unconscious and die.

ILLNESS

The concept of the soul figures most centrally in the Rarámuri conceptualization of illness. The external state of a person directly reflects the state of his indwelling souls. His normal state of well being and health requires that his souls are happy inside the body and that they can easily pass out of the body and successfully return. Illness for the Rarámuri is caused by the interference of spirits from outside the body, most often by the devil himself or his allied spirits. They can capture a person's souls or injure them, for example by putting foreign objects, like **re'e-ke** 'stones', **nowí-ki** 'worms', or **muri-ki** 'tiny turtles', into their bodies, usually into their stomach or back. As I pointed out in the film, Rimihio indicated (as reinforced by his gestures) that his son Pasiko's souls in all parts of his body were injured, causing him to ache all over.

The Rarámuri men that have the best and most intelligent thinking souls become **owirúame**, or healers who are able to cure people by recovering their souls from their captors or by extracting the offending foreign objects from the body in a curing ceremony. These persons become shamans, being endowed by the deity with special knowledge and an ability to think and dream well. They are able to heal or rescue a person's souls from the malevolent beings from the outside. If the shaman's thinking soul becomes allied with the devil he will become a **suhkurúame** or sorcerer. The **suhkurúame** are no longer able to cure people. They cast spells and capture or wound the souls of the people, causing illness and death.

Curing ceremonies can be performed privately in a single household, but are often performed in public on a circular dance patio, **awíá-ci**, that is swept clean and often enclosed by protective brush. In one version of the

ceremony the men sit on one side and the women on the other. One or more (pre-Columbian) wooden crosses surrounded by sacrificial food and drink stand in the center of the circle. A large ceramic container of corn beer is placed nearby. The shaman begins to chant and sing and to shake the rattle guord. He begins to dance the **yúmari** and the men follow behind him in a clockwise motion around the sacrifice. The women now form an outer circle dancing in the opposite direction. The dance continues for a long time, and the shaman changes the song at intervals as he finds it appropriate.

The audio tape that follows presents six distinct chants that were sung at intervals during the yúmari dance in the Tuciaci valley in May 1988.

1- ha hai hu he he hee hee hu

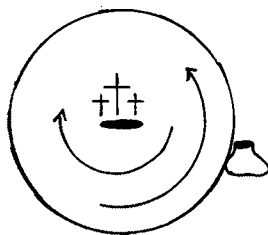
2- he heu ha haa hu - ha heu he he hu

3- ha ha ha hu - ha haa he he he he hu

4/5 song/chant

6/7-ha ha he heu hu - ha ha hu - he he hu

9/10



Musicians playing handcrafted violins and guitars join in and sit at the edge of the dancing space. After the dance the shaman approaches the sick person(s) and begins the cure. He administers corn beer, as well as healing herbs and medicinal remedies, including at times peyote or mushrooms. The souls are restored to health, and foreign objects are removed from the afflicted. The shaman performs a ritual speech in rapid monotone and then the dancing is resumed and continues on for many hours. The ceremony ends with a return to the household, to the fire, where the party continues with feasting and drinking until all of the sacrificial food and beer are consumed.

These public curing ceremonies are often combined with the rain dance or other ceremonial dances that are performed for the purpose of invoking the help of the deities. The combined ceremonies vary from household to household, and from valley to valley; and while there is a consistency of ritual practice, the individual manifestations of the rituals show a great deal of improvisation and substitution. What follows is an account by Rakirín, one of my informants, who himself became a shaman when he was twenty-two, after observing and learning from his father's practice as an

owirúame/owáame, 'curandero' in the valley of Tuciaci.

(20) *Ne ono-rá onorá*

I father-poss

my father

(21) *ba'oréa-ci behle-re pe ne ono-rá ana'í tuceaci nawa-re.*

Ba'oreaci live-perf but I father-poss here Tuciaci arrive-perf

lived in Ba'oreaci but he was born here in Tuciaci

(22) *ne ée-ra geyoci-ci newá-ri-ge ne ono-rá*

I mother-poss Geyoci arrive-perf I father-poss

my mother was born in Geyoci my father

(23) *(one-am) owáame ké mi re'pá reso-cí ahkibé e'ne-mia naú-ame*

shaman was up there cave-loc went see sick

was a shaman he went up into a cave to visit the (spirits) of illness

(24) *apu-a'rí tá ke re'ré reso-'cí besá rukó kohči-re*

when little be down cave-loc three nights sleep-perf

when he was a young boy he slept three nights down inside the cave

(25) *paca-ko we ba'ó iri-gá-rá amarúame raha-gá iri*

inside very beautiful be everything burning brightly be

it was very beautiful inside, everything was aflame and brilliant.

(26) *cihóonsa-go ku ma'cina-re ma 'cota-re owaá apu-ki ku-sa'é-a naú-ame*

then back came-perf now begin-perf cure who again recover sick

when he came out he started to cure people healing the sick spirits

(27) *sinóma we garé apu-ikí ku hásimi - we raisá ma ku'éna-ga*

all very healthy who again arise very well now again walk

who then became healthy again, who recovered and were happy to be able to be walk again

(28) *o'lorí á-ria ba apu-a'rí ku-sa'e-ko ba ko'sá batari*

chicken give when restore eat beer

he gave the spirits chicken to eat when he cured them

(29) *á-ria biré sehkorí á minó okwá róci uga*

giving one pot give them two guord with

giving them corn beer out of a clay pot with two gourds,

(30) *cihóonsago weró re'pari 'weti meme uga korogá uga weró*

then throw liquid up up maguey with collar with up

then he would splash it in the air scattering (the food), spraying (beer) with an agave leaf and with his totem necklace

(31) *ke tasi sewé siga cora o'moná-bo sinéame ku-sa'e-bo aré hipi-ci co*

neg sad be whay sad-pl all recover-pl mod right now also

"do not be discouraged! why are you sad? all of you are going to be cured now"

- (32) *cihóonsago semé ba besá semé-ri-go owé ba si ba*
then play music junc three times play junc cure do junc
then he would play the music three times administering the cure
- (33) *ma biré oí apu ku'iru-ma lóci ca'pí-a pinó-ko enahi-wa ahtí besá cohké-ame nahí*
now one medicine help-fut guord grab refl sing sit three times sing
and an herb balm to the ones he was helping grasp the gourd (drink) himself chanting
three times
- (34) *besá cohké-ame nahi-sa cihóonsago ma rewé ba nahletara nehá ba ma 'róci uga*
three times sing- then now finish thank give/past now gourd with
he would sing it three times when the chant was finished he would thank him with
- (35) *uga ku nehá apu ma neá-re ici-kó 'á-m pa*
with again give/past who made him demo give-stat
some brew in a gourd and offer it to the one who made him
- (36) *cohkóbi-či iri-gá peka-bé pa nará cuhkú pa ma kúri-si orá-sa ahkíba-m pa*
knees-loc stand blanket cry bent now cross self do go/past-stat
standing on his knees on a blanket crying then he would cross himself and leave,
- (37) *ariosi ba hiani-am pa.*
goodbye say
saying goodbye.

DEATH

At death the body is said to return to the earth and become clay, the original material used, in the general view, to make people in the creation. In the the majority view, death occurs when all of a person's larger souls leave the body and do not return. But notice in the following account of Rakirín's father's death that the speaker is not sure whether all of the souls or just some of the souls leave the body at death.

WHEN WE DIE: Rakirín's Father's Death
From 1986 Cuahtemoc Notes (Audio Tape)

- (38) *apu-hóonsa na sowi-sa tamóé kanoa kame tomoe-ko ba kaci sí biré pa*
when die-temp we board be we junc neg move intens junc
when we die we are just an empty shell it does not move at all
- (39) *cihóonsa káruwa kam pa kaci biré pa o'were rua ici acaní ru ba*
then shadow be junc neg intens junc big pl quot this ay quot junc
we are then just shadow (spirit) they say that the spirits are big (but they are not)
- (40) *icigó wé ra'iča binó ko ba kāci timú-ka ba timú-ka ra'iča icikó ba*
demo intens talk refl junc while dream- junc dream- talk demo junc
the spirit talks to himself he talks as he would if he were dreaming

- (41) *apu-ré ta ke ra'ica ba we ra'ica co pa*
comp we neg talk junc intens talk also junc
not in the way we (normally) talk he just talks and talks!
- (42) *apuregá károwa-ra ba rumu-ka ana eena-m co pa ko'á-m ta-am pa*
resemble shadow-poss junc dream pos do/go-prt also food ask-prt junc
he is like a shadow he also walks as as in a dream he asks for food
- (43) *hi ani-am pa nehé roa ba hi ani-am pa cihoonsago pe'ta mani-bo ra ba*
this say-prt I hunger this say then little put-pl junc
he says, "I am hungry" this is what he says and then we give him a little
- (44) *to'torí mani-bo ba hi-rigá ra ba peka ra ba ici-gó na maná ba*
chicken give-fut pl junc this-manner lay out junc this then put down junc
we put some chicken like this we put it out on the blanket (at the head of the corpse)
- (45) *a'ri-ko pinó nawa-am pa ma suwá-ru-ame ko'á-me tamoe-ko ba*
soon he himself arrive-prt junc now consume-pass-prt eat-nom we junc
soon he comes over to it afterwards we will have consumed all the food
- (46) *ma bahcá ko'sá icigó ba batari ma ra ba mani-bo pe'tá*
now first eat-imp this junc teswino now junc now give-fut pl a little bit
but first he has to eat now we give him some corn beer
- (47) *pe biré baso ko ba pe biré ipurete apuregá ta baso hi curá*
one jar junc one gallon like we jar this size
just one jar the size of the ones we use
- (48) *ne mani-ma batari apuregá tá noká hipi ba ko ta hipi bahí-a co pa*
I put-fut beer like we do now junc how we now drink also junc
I put out beer for him just as we do today just as we drink it today
- (49) *o'torí iri mana-bo ba a'ri-ko binó ma nawá-am pa hi'si-ame noke-a iciregá ba*
chicken put-pl soon refl now comes junc here do/go-prt move junc
and we put out chicken for him soon he comes over to it moving towards it like that
- (50) *ma simi-a pa noke-am pa ma abé pahcá ko'sá icigó ba "ma ne ga'rú bosá pa"*
now go junc move-prt junc now intens before eat demo junc now I good full junc
he approaches it he must eat first! "now I am very full", he says
- (51) *rewé-ru-si bahí-a ba pagó o'rú bahí pinó ko ba ko ta bahí hipi-ko ba*
continue-pass-too drink soul big drink self be junc how we drink now junc
now the others keep drinking the soul himself drinks a lot and we drink a lot, too!

Lorenzo:

- (52) *oceco arewá pacá an-có*
other spirit second (before) also
is the second spirit there, too?
- (53) *an co apuré ta mik-sá co pa pacá n acó simi-am pa hana amariám-ko tó-ka*
yes too like we die-when also junc second also go-prt junc this body bury
yes, too, just like when we die the second spirit leaves, too this body will

- (54) *reka-sa simi-am pa hana-ko pe karí ka-m pa apu simí ko ba*
recline do-stat this but house be-prt junc when go junc
be laid out to be buried it is just a house, when the souls leave
- (55) *ici ta acani-am rua ba tamoe-ko ba arewa-ra ku-si-mea areko*
this we say-pret quot junc we junc souls return-fut mod
this is what we say the souls return, we believe
- (56) *pe sinéoma ku-rewe-sa tomoe-ko iciregá pe kanoa ka-me tomoe-ko ba*
all return we like that just log be-prt we junc
when all of our souls leave like that then we are just like a wooden log
- (57) *apuregá gé nehé onorá ba nasipa ruko diez y seis ka-m pa*
comp be my father junc middle night sixteen be-prt junc
the way it was with my father in the middle of the night on the 16th of September
- (58) *apu ná ma suwí pa toreoni ba amariame o'kó aní amaruame hanagé*
when already finish junc at Torreón junc whole suffer say whole here
when he died at Torreon "my whole body aches", he said, "all over"
- (59) *mo'o-cí ma o'ko-am pa surá-si o'cí ma o'kó aré pa*
head-loc now hurt-prt junc heart bone now hurt mod junc
"my head is aching and my heart and bones are aching"
- (60) *pege'me ne sura-cí areko pe cahkena co areko ahaka 'nina ma ahtí-am sura-ko ba*
neg I heart-loc mod but change also mod on the left side now sit-prt heart junc
now not so much my heart the pain moves around it has changed over to the other side"
- (61) *repa-ka ciká-re oremá an rete-am pa i'riko-si rukó ba*
up in sky bend-pret bad/spirits see-prt junc harm very much night junc
up in the sky looking down were the evil bird spirits - he could see them
they would harm him in the night
- (62) *we pe cabé na ra'íca-re ru 'rina ba pe na na htúgoná má-ame pacú-sia na na*
intens before talk-pret quot junc conj down there go-cont stream-nom
he had talked to me often about them before but now down they came streaming in
- (63) *ici aní ic ané ne onorá ba nibí apu mi re'pá mawa-am pa*
this say I father junc look that there up fly-stat junc
this is what my father said, "look what is flying up there!"
- (64) *cabé 'naka'rina ra'íca-re pa ici benito suhkuríame ba*
earlier right there talk-perf junc this Benito brujo junc
Benito, the brujo (shaman) had mentioned them to him earlier
- (65) *cihóonsago ná nasipa ruko-ka ma natakega-m pa*
then half night already lose consciousness-prt junc
and then in the middle of the night he just died

- (66) *hanagoná mu'tu-ka cuhku-am pa kin onó ba*
here cradle- bent-stat junc my father junc
I held him in my arms like this, my father
- (67) *sépe lá copí o'áam pacá ko ba hanagoná ra'ta-re-am pacá ba*
intens blood pure mouth inside junc demo prox explode-perf-prt inside junc
blood was flowing from his mouth his heart just exploded inside
- (68) *kaci-go cikime aré pa aána ku-ená-ma are pa*
neg happen mod junc pos again-be-fut mod junc
if this hadn't happened he would still be here today ...

This is one of several different versions I have recorded of Rarámuri explanations of what happens at death. In this version the two large injured souls are leaving the body, causing the person to suffer as they depart. Here he says that all of the souls leave the body at death. On another occasion when he was telling about his father's death (cf. items (16) - (18), above), he had told me that it is only the two larger souls that leave at death, and that the smaller souls remain to be buried with the body. Rakirín believes that after the souls leave the body, they take a journey to the mountain paths that they have travelled in life, and after a few days they return and remain in the vicinity of the body until they are requited with food and drink. The Rarámuri perform a death ceremony, with sacrifices and the **tu'túguri** dance, for the souls of the dead. Then if all goes well, the souls then begin their eventual journey up to the place where the deity lives. Perhaps not fortuitously, the name of this dance, **tu'túguri**, resembles the word for owl, **tu'túguri**, for it is felt that the owl's hoot is a repetition of the expression **kuu'tuusi muukuuri**, in which **mukuri** is the perfective form of the verb 'to die'. If an owl is thrice heard on three consecutive nights within the vicinity of a sick person, the person will die. The souls of the dead present the biggest danger to the living during the interim period before they are released to go to the higher world. They may become angry and bring about the death of a child or other member of the household.

The big souls do not travel together. Some may remain around the household or may frequently return, unless the living space is abandoned by the surviving family members at least for a time. Some families are more concerned about these lingering souls of their dead relatives than others are. I was once taken on a hike through a valley where all of the older houses had been permanently abandoned and left to decay because of a death at the respective households. The Rarámuri of Tuciaci perform the **tu'túguri** ceremony for the dead about a month after the death, to assure their souls a safe journey to the-one-who-lives-up-there. They do not want the souls of the dead to remain in the valley, because if they remain they

make the survivors sad and thereby deprive their souls of their strength and vitality. Rakirín tore down his father's house and built another one further up the hill, a safe distance away from the family house.

DECEASED FATHER'S HOUSE TORN DOWN

(69) *ma sowi-re kin onó ici 'níara garí-ra gahúna-ga nehé o'mona ba rete-a ici karí*
now die-perf my father poss house-poss tear down I sad junc see- demo house
My father died I tore down his house I was very sad when I looked at it

(70) *panina newá pa garí pa o'rú aorí-ci nehé ihkirí newá garí*
up slope make house big oak-loc I new make house
further up the hill I made a new house underneath the big oak tree

(71) *ke tasi o'mona ba ma si'nú newá-saká garí pá we ne ganira*
neg sad junc now other make-cond house junc intens I content
I am no longer sad now that I have made another house I sleep very

(72) *kohcí ba kaci ne o'cé rimu-ka ba ma cahkena newá-sagá ba*
sleep junc neg I still dream junc now change make-cond junc
well now I no longer dream about him I have built another one

(73) *ke tasi o'moná-ru sinéoma kuci hanagoná siri-am pa*
neg be sad mod all children here born-prt junc
I am not sad, you see all of my children were born here in the new house

These Rarámuri cosmological models of reality lack consistency, both for single individual informants and from group to group. Nor do we find modules or pockets of orthodoxy in the culture that would indicate a cognitive proclivity to orient within regimented cultural frames. In response to questions about religious matters I have frequently received puzzled comments like, *pe nehé ke ne ga'rá mací icigoná nehé*, "well, I'm not really sure about that, ...". There is no attempt by the Rarámuri to resolve the discrepancies or to create a unified view, perhaps (as Merrill 1988 suggests) **first** because there are no consequences for their behavior and **second**, there is no imperative for the details of the models be consistent. A **third** reason for the variation is that the cosmology rests on tradition and does not require confirmation by an empirical appeal to external reality. And given the richness of their world view that results from the variation, the meaning of the cosmos would not be enhanced by any imposition of further logical consistency.

Thus despite the existence of an underlying consensus on the basic religious and cultural themes and ideas of the Tarahumara world-view, there is little motivation for uniformity of the theoretical details. The Tarahumaras are seldom asked about such theoretical questions in an abstract way. It is not part of the normal discourse of the culture. Only curious outsiders ask

questions about the cosmology using this mode. Learning within the culture is accomplished by individuals, primarily in informal settings, observing the consequences of events and happenings that occur in real time (like what happens in the household when a person dies), as well as the discourses that are an inevitable part of them. The teaching of **all kinds** of knowledge is extremely informal. The verb for the concept 'learn' is **bene-ma**, and the word for 'to teach' is, **bené-re-ma**; the same except for the additional occurrence of a suffix **-re-** that renders **bené-re-ma** slightly more transitive than **bene-ma**. Teaching is largely done by example or by brief explanation in context - answers to questions are often oblique. Vagueness is accepted. Such learning inevitably touches all of the basic cultural notions, including social values and behaviors; dress, postures, manners; skills like cooking, use of the axe, sewing, weaving, brewing, planting, harvesting, playing a musical instrument. Cosmological ideas and other more theoretical knowledge is also transmitted in this way. - and learning to speak largely follows this pattern as well. The principal teachers or models for imitation and learning are the parents, elder siblings, or the grandparents in the extended family. Children learn in the relative privacy of the household. The Tarahumaras are very loving and caring in dealing with their children, but their attitude in child rearing is *laissez faire* and permissive. In learning to speak the children observe, mimic, and experiment. Just as there is no formal religious catechism, there is no formal language instruction; and the adults seldom if ever correct the speech of their offspring. Diversity in speech form is thus not monitored against some grammatical standard that is separate from actual discourse. It is taken to be the norm rather than the exception.

For the purpose of highlighting by comparison some of these variant features of Tarahumara culture, I would like now to engage a short interlude in order to evoke some cogent features of another Amerindian culture from a much earlier period and far to the north of the Tarahumara speaking area, namely that of the early inhabitants of Mesa Verde. We can trace, in the archeological evidence, a long period of cultural development of the people who entered the Mesa Verde area some 2000 years ago. For convenience, we can identify broadly four stages of cultural development.

STAGE I

Archeological evidence shows that the earliest Amerindians to inhabit the Mesa Verde region were hunters who had a semi-nomadic lifestyle. At this stage the people have a comparatively simple culture. They lived in caves, they were good basket weavers. They did not yet have pottery, they had no built houses. Excavation indicates in at least one area that these people had begun to experiment with permanent houses, both in caves and on open hilltops. They had tools of wood, stone knives, bone awls, and primitive

scrapers.

STAGE II

The acquisition of new materials by their descendants resulted in significant changes in the culture. Beginning about 450 A.D., they develop the technology to make pottery, resulting in expanded possibilities for food in their diet, and in increased storage facilities for food and water. Life in open caves gives way to experimentation with permanent built structures. Pit houses appear that are built partially underground and have clay or stone walls. Many of the earliest pithouses are built in caves, but within a short time pithouse villages, consisting of individual pithouses, are being built on the mesa tops and in open valleys. By 750 A.D. many of the villages were built entirely above ground and the pithouses are deeper and begin to be used as ceremonial kivas.

STAGE III

About 750 A.D. the people of this region adopted a new kind of cradle. The soft, woven cradle now gave way to a hard cradle made of wood. The standardized adoption of the new cradle resulted in a radical change in the appearance of the head, flattening and widening the shape of the skull. Because these people constructed large, multiroomed villages the people of this period are known as the "Pueblo Indians". Excavations show that the builders were doing a great deal of experimenting. Building were often joined together, walls of many types were built. Large numbers of ruins have been identified on the mesa tops, indicating that the population continued to increase. Population increase was accompanied by increased concentration and standardization of cultural practices. Excavations of the architectural ruins of the period from 850 A.D. to 1100 A.D. show a steady development from small masonry pueblos with crude stone and adobe walls to larger and larger pueblos first with walls of well shaped single course stones in even rows, followed by pueblos built of thick, double coursed masonry with smoothly worked stones. Constant experimentation gradually gives way to an ever increasing standardization of design and execution. This growing standardization extends from architecture to ceramics to apparel, to tools, jewelry, and artifacts.

STAGE IV

The Mesa Verde culture enters its final period, identified as the Great Pueblo Period, about 1100 A.D. This period comes to an end just before 1300 A.D., when the people leave the area, never to return. This is a period of rigid standardization and strict regimentation in the society. At about this time the pueblos became much larger with a much larger

number of rooms. Living conditions are now much more compact. The architectural layout of all the villages of this period is uniform. The massive stone walls are made of stones carefully cut and laid in neat, even courses. Smoothly plastered walls are decorated with brightly colored designs. The villages have numerous kivas, which are carefully built on a definite pattern. This uniformity of architecture indicates rigid ceremonial practices, that must have been the result of instruction and enforcement.

Thus to reiterate in brief; the people arrived in the Mesa Verde region as seminomadic hunters and gatherers, who lived in small unorganized bands. Because of their life style they left little evidence of their sojourn. But we do know that their culture was initially characterized by a high degree of **variation**, and improvisation. Individual initiative was the key to survival. But as the population grew, the society became more complex and more **regimented**. By the time of the Great Pueblo period of Mesa Verde, the climax to the many centuries of cultural development, we see a mass culture with a strictly enforced **uniformity**, that apparently required the people to move in a certain groove. Artisans and craftsmen were highly skilled, but they were also highly disciplined, and they all followed the same patterns. The religious and social life was rigidly standardized and regulated. The cognitive styles of the beginning culture and that of the ending culture were apparently at opposite poles on a continuum of standardization/ ritualization of cultural practice. In more traditional terms we might characterize the later stages of the Mesa Verde culture as Apollinian in contrast to the Dionysian precursors of the initial stages.

If we were to attempt to locate the Tarahumara culture within such a developmental framework (from roving bands of hunters and gatherers to a sedentary standardized mass culture), we would have to place them further toward the beginning stages than toward the end. Wick Miller suggests that the Southern Uto-Aztecs have lived in their present regions for several thousand years. The scant archeological evidence that is available indicates that the prehistoric inhabitants of the area gradually shifted from being nonsedentary hunters and gatherers to becoming semisedentary farmers of corn, beans and squash. Architecture and living space is highly variable, both in the design and in the construction materials used. Tools are improvised or borrowed. Art is pragmatic and ill-defined; articles of beauty are crafted for practical use, rather than being created for permanent appreciation. The cosmology is not regimented, there is no orthodoxy, and much of the variation associated with the concept of the soul is random and idiosyncratic. And this lack of standardization of belief and behavior correlates with the high degree of diversity that we observe in the language data as well.

A few decades ago anthropology looked to linguistics as a source of

heuristics for studying human cultures. They attempted to view theoretical knowledge in a culture as a static, internally consistent set of ideas that could be distilled and described apart from the concrete activities of everyday life. Their descriptions took the form of logical relations among sets of semantic paradigms. Variation, vagueness, ambiguity, and inconsistencies tended to be ignored. Sperber points out what he calls a methodological flaw, that "all native utterances get distilled together; their quintessence is then displayed as an homogeneous world-view where, indeed no epistemological differentiation of beliefs occurs. This is, however, a fact of ethnography, not of culture." (1982:165). Recent trends in anthropology tend rather to promote a different notion of cultural knowledge in which culture is viewed as a process that guides and gives meaning to social interaction while simultaneously emerging from it. James Clifford refers to this view as emergent culture (1986:19). In this view, culture and society do not preexist the individuals through whose actions they are constituted, and from whose actions they emerge. Patterns emerge not as reapplications of standardized systems of knowledge, but as repetitions of concrete social practices.

But just as ethnography is not the culture, so linguistics is not the language. The development of heuristics in cultural studies appears thus to have gone full circle, and linguistics is now looking to anthropology for methodologies in developing cognitive approaches to the study of humanity. Thus in linguistics, we have Paul Hopper's proposal that **grammar is emergent** in the same way (1987). What may appear to a linguistic observer who is trained to look at grammar as a static, internally consistent system of linguistic knowledge is in fact a dynamic, always highly variable, and partially inconsistent phenomenon. In this way it is similar to other human cognitive phenomena. And when speaking is viewed as a process embedded in and emerging from social life, the presence of variation is no longer a disturbing anomaly. Many linguists have been reluctant to include the fact of variation in their grammatical descriptions.

The degree of variation in the linguistic forms of Tarahumara is no longer tolerated in educated American English, because of our prescriptive regimentation of the language, as a consequence of our literacy and of our linguistics. But older texts of earlier forms of English do in fact show much more variation of form. And a careful examination even of current spoken texts in English will show a much higher degree of variation in phonological form than we have trained ourselves to expect or accept. German, of course, has its standard language police in the form of Siebs and Duden, but the many dialects of Old High German show that the pre-literate language must have been considerably less regulated and uniform. And France is well known for its arbitrary regimentation and control of the language and its protection of Modern Standard Parisian French from the

ever present onslaught of chaos from within and without. The list goes on ... of our massive, disciplined, regimented societies.

As linguists, and despite our disclaimers of prescriptivism and our promotion of descriptivism, we have largely been comfortable with the view that language is by and large a finished product to be discovered and delineated; an object that can be reduced to formal description in rules and paradigms, or rules and diagrams or some other permuted notation. One of the early objections offered in critiques of generative approaches to grammar was that they are essentially prescriptive and normative. The norm in this case is the well-known fictive competence, in place of a standard literary language, but the similarity is of course clear. Both in our synchronic and in our diachronic work there has been a tendency in linguistics to expect languages to be essentially regular in structure, so that is what we tend to find and describe. The messy residue gives us sweaty palms; we don't like it. After all, the Neogrammarians demonstrated clearly the danger of accepting residue as anomalous too soon, and we tend to think that if we knew enough we would be able to resolve all of the chaos into regularity. But if language is not a logical machine, there is no potential gain in forcing the fragments of patterning, that we observe, to encompass in theory all of the forms in the spoken discourses of a culture to the same degree.

Because the forms of a language occur and recur at such high rates of frequency in discourses, we would expect them to be more ritualized and fixed (Haiman 1994), more arbitrary, and more grammaticalized, than features of the cosmology would be. But this fact also presents a danger for linguistics; because of the relative stability of many of its patterns, language can more easily give the impression of being homogeneously well-defined and code-like in its synchronic essence. From observations of patterning in speech emerges the **illusion of language** that Syd Lamb (cf. Lamb 1993) has also talked about. But the forms and patterns of language are not equally stable at any given time. The more useful a structure is, the more it will tend to be repeated; and the more it is repeated, the higher will be its degree of structuralization. Linguistic structure can not, then, be homogeneous in the strength of its structural patterning. Some structural patterns in language, just as the structural patterns in other manifestations of culture, will be always stronger than others at any given time. And thus the patchwork of gradient strengths of patterning in language is forever dynamic and variable.

It is, for me, an interesting fact that there is in Tarahumara this close correlation between structural freedom in speech with freedom in the other primary systems of cognitive and social patterning. I do not intend to make a strong claim that **all of every** culture's conscious and subconscious

knowledge will **always** show such high correlations in their degrees of regimentation and regularity. There might well be cultures that show a relatively high degree of structural homogeneity in their speech, and at the same time show a **lack** of regimentation in other systems of knowledge. I would, however, expect that the psychological effects of regimentation would be generalized in the culture.

And in closing I would suggest that a lack of homogeneity in the language of the Tarahumaras, **as reenforced by the concomitant lack of uniformity in its other primary cultural systems of knowledge**, strongly suggests that grammar is not a biologically transmitted machine, that is stored and activated in a hermetically separate module, but that freedom of variation in a language will tend to echo or parallel the degrees of variation in other human cognitive phenomena in a given culture.

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INAUGURAL LECTURE

WHAT CAN WE BELIEVE THESE DAYS?— CAN LINGUISTICS ACTUALLY BE SCIENTIFIC?

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What can we believe these days? How can we choose among the many extant grammatical theories of language? How can we choose among the theories of Chomsky, Fillmore, Halliday, Harris, Hockett, Lakoff, Lamb, Langacker, Lieb, McCawley, Pike, or any of the many others? Or must we reject all of them in favor of some other theory? And within any one of these positions, how are we to decide how to analyze a particular utterance?

How are we to decide what to believe in linguistics? Must we leave it as a matter of following an unexamined tradition, or the latest trend, or the dictates of a charismatic individual, or accidents of education, or simply personal preference?

Or are we to give up the search for coherence altogether, each of us tacking together a different patchwork quilt of miscellaneous pieces of theory? No, it is not necessary to give in to eclecticism. In science there are criteria for deciding what to believe about the natural world. In science one can legitimately seek unity and coherence in nature and actually make progress toward finding it.

The Conduct of Science

Grammar or science?

Scientific criteria for deciding what to believe about nature have been developed over the last four centuries and have been spectacularly successful in their application in physics, chemistry, biology, and the other natural sciences.

For nearly two of those four centuries linguistics has aspired to become a science. But despite our best efforts, linguistics is not completely scientific, for the discipline still lacks scientific criteria for deciding what to believe. Can linguistics actually become scientific?

Linguistics did not originally develop as a science. It developed out of the 2000-year-old Stoic semiotic theory of knowledge and Alexandrian classical scholarship; it was never intended to be scientific. Modern linguistics is built on and inextricably incorporates ancient grammatical and philosophical preconceptions that stand in opposition to those of modern science. Grammar has turned out to be incompatible with science.

This presents us with a dilemma. All of our accumulated linguistic lore is and always has been in the grammatical-philosophical domain where its preconceptions and assumptions are incompatible with those of the natural sciences. Yet linguistics aspires to be a science. Which should we follow, grammar or science?

Our dilemma is that if linguistics remains a grammatical discipline it can never avail itself *at its most basic level* of the scientific criteria of acceptance; but if it becomes a science it must abandon grammar and the philosophical domain entirely and reconstitute itself in the physical domain as a natural science.

This paper resolves the dilemma by abandoning grammar and embracing the scientific tradition instead. We will see that in abandoning grammar and reconstituting linguistics as a natural science in the physical domain we actually gain more than we lose.

Science studies the real world

The natural sciences always keep separate and do not confuse three quite different things: 1) the real physical world out there, 2) our theories of the real world, and 3) our observations of the real world.

Of these three things: the real world, our theories of it, and our observations of it, only the real world would remain if we as observing and theorizing scientists were to withdraw. Our theories of the real world and our observations of the real world would disappear with the scientists.

When I speak of the real world, I do not mean perceived reality or seeming reality, which would not remain were the scientist to withdraw. I mean the real physical world which exists in advance of our efforts to study and understand it.

I suppose some philosophers might doubt that there really is a real world out there, holding that it's all an illusion. But we do have considerable evidence of the reality of the natural world in which we live. We knock on a real door, walk on a real floor, and eat a real hamburger and are nourished by it. In science, as in everyday life, we take it as given that there is a real world out there independent of us as observing and theorizing scientists; it's not simply an illusion.

The part of the real world we are interested in studying includes people interacting by means of sound waves. Those people and the sound waves would still be there if we as scientific linguists were to withdraw. Notice the conceptual separation, typical of the natural sciences such as the biomedical sciences, between the people as objects of scientific study and we the scientists who study them.

I should make it clear that when I speak of people or sound waves as existing in the real world, I should be seen as *referring* to the existing reality, not *describing* it in any way. It is up to the scientist to characterize the existing physical reality in terms of theories and to test the theories against the physical reality by means of observations and experiments.

Separate from and not to be confused with the real world itself are 2) our theories of the real world. These are inventions of the scientist to represent our current best understanding of the parts or aspects of the real world we are officially curious about. They would vanish were the scientists to disappear. Our theories are always held to be tentative, although many of them are surely correct and will almost certainly never have to be abandoned.

We calculate predictions from our theories to be tested against the real world. We then try to test our theories by comparing their predictions with reality.

The testing of hypotheses or predictions of theories against the real world requires that the scientist 3) make observations of the real world or conduct experiments on the real world.

Our observations of the real world are not to be confused with the real world itself either. They would vanish were the observing scientists to disappear. They are the means by which the scientist has contact with reality, the means by which theories are tested against the real world. Observations also sometimes give unexpected and surprising results and lead to new theorizing and new knowledge.

The conduct of science is similar in some respects to the conduct of everyday life. When shopping for a pair of shoes, I am attracted to a pair offered (the real world). They are in my size (theory) and I think they may fit my feet (prediction or hypothesis based on theory). I try them on (experimental test of the hypothesis) and find they pinch my toes. I conclude that the shoes do not really fit my feet (hypothesis rejected on the basis of observational or experimental evidence).

Criteria of acceptance

There is some truth to the characterization of science as just careful common sense. But common sense may conceal questionable preconceptions and assumptions which prudent care dictates that we examine explicitly. So science begins with doubt. Scientists are trained to regard all their theories with doubt, especially those inherited from a tradition, pending the results of searching examination.

In this the criterion of acceptance of hypotheses or theories when doubts arise is the ability of their predictions to pass tests against the real world by means of careful observations and experiments. Theories are not always clear as to what they imply about the real world. Very much of what is done by scientists in the theoretical side of science has to do with calculating predictions from theories to be tested against reality.

When the predictions of early theories of the atom did not agree with observations of the spectra of light emitted, they were abandoned in favor of newer quantum theories whose predictions did agree with observation and experiment. When predictions of the Newtonian theory of the motion of the planets did not agree with observations of the orbit of Mercury, the theory was abandoned for these purposes in favor of relativity theory.

Observations and experiments may be difficult to carry out and the results open to question, especially if they are surprising. The criterion of acceptance of observational and experimental results is their reproducibility when questioned. Very much of what is done by scientists in the observational and experimental side of science is concerned with reproducibility so as to ensure the soundness of the tests of theory against the natural world.

When the observations of cold fusion could not be reproduced by other scientists around the world, the claim that some materials show cold fusion was abandoned as false. When observations of high-temperature superconductivity were in fact soon reproduced by other scientists around the world, the claim that some

materials show high-temperature superconductivity was supported and is now believed true.

So in science there are agreed criteria by which we decide what to believe about the natural world. Advances in science have often involved doubting and trying to test received wisdom from the ancient Greek world. As a result, many strongly-held traditional beliefs had to be abandoned. They could not stand up to the criteria of science or were not even testable, having no satisfactory contact with reality.

Linguistics also had its origin in the ancient Greek world. In its effort to become more scientific, linguistics has already abandoned prescription in favor of description and it has abandoned Greek and Latin grammatical categories in favor of categories more fitting the evidence from the languages under investigation. We should not be surprised, then, that as linguistics continues to move more completely into science it will have to reexamine and possibly abandon still other preconceptions, assumptions, and concepts of grammar and language that are remaining relics of ancient thought.

The assumptions of science

As ancient preconceptions and assumptions were abandoned by science, other preconceptions and assumptions at a deeper level were uncovered, and they, too, were held up against the criteria of acceptance of science. In many cases they, too, had to be abandoned. What we have left are the following four minimum assumptions underlying all science. All other assumptions have been abandoned. No science accepts any assumptions other than these. Particularly, no science accepts any assumptions special to its subject matter. This is one way in which all the sciences are unified into one coherent whole.

The first assumption of all science is that there is a real world out there. It's not simply an illusion. This is not to be construed as saying anything about that world except that it exists as a physical reality separate from and independent of the scientists who wish to study it; it's not just an illusion. The natural sciences are thus disciplines that concern themselves with the real physical world, the domain of nature, the physical domain.

The second assumption of science is that the real world is somehow coherent. This is not to be construed as saying anything about that world either except that it is not so chaotic that we have no chance of understanding it in terms of our theories and testing the theories by means of observations and experiments. This assumption simply expresses our confidence, based in part on past experience, that we may actually be able to find out something about the world.

The third assumption of science is that we can trust our reasoning abilities. We can trust our ability to calculate predictions from our theories for comparison with the real world. Formal mathematics and logic may be used to assist us in careful reasoning. Theories are often couched in logical or mathematical terms to facilitate calculating predictions to be compared with the physical reality they are supposed to be theories of.

Mathematics and logic themselves, however, are not natural sciences. They

do not concern themselves with the physical domain of nature and thus they cannot be tested by observation and experiment. They concern themselves with what has been called the logical domain, the domain of reasoning and calculating, where there is nothing in the real world that they are theories of to test them against.

The fourth and last assumption of all science is that observed effects flow from real-world causes. It should not be construed as saying anything about those causes. It is simply the assumption by which we infer real-world causes behind our observational and experimental results as we test our hypotheses and theories against the real world.

In describing the criteria and assumptions of all science here, my aim is not to be prescriptive but simply to characterize the best practice of scientists. In doing this I am definitely not following the lead of any philosophers of science, although some philosophers of science may well agree with the views expressed here. Rather, I am laying out my own understanding of how science operates learned during the course of my training and experience in physics. I don't believe that anyone with science training would take exception to this characterization of science.

The conduct of science is not a matter of following a cut and dried prescription or "scientific method" in spite of what some logicians, philosophers of science, and elementary textbooks have claimed. It is more like how the best fictional or real detectives carry out their investigations of difficult cases. It requires an optimistic "can do" attitude, creative imagination, alertness to the smallest clues, willingness to question received opinion, boldness in forming hypotheses and following leads, sometimes dogged perseverance against repeated setbacks.

The Question of Utterances

Let us now apply these criteria and assumptions to topics of interest in linguistics and see how far we can go in developing a reconstituted linguistic science. Let us start by considering noises.

Noises

Many will remember the childhood conundrum, "If a tree falls in the forest and there is nobody there, does it make any noise?" The answer, of course, is that the falling of the tree causes a disturbance in the air (sound waves). A schoolboy in the forest might hear the sound waves and interpret them as the sound of a tree falling.

We need to distinguish four things here: (1) the physical source of the sound waves; (2) the physical sound waves themselves; (3) the person's hearing the sound waves; and (4) the person's interpreting what was heard.

Science already provides a general understanding of the first of these, the physical source of the sound waves. The subdiscipline of acoustics in physics covers vibrations and sound and studies the physical processes involved in sound production. In many cases, such as the falling of a tree or a gun discharged by a hunter, we can observe the source of the sound visually and study it by videotape and other instruments.

The science of acoustics also covers the second topic, the properties of the sound waves themselves and their propagation through the air and other materials as well as their reflection, diffraction, and absorption. Sound waves can be studied instrumentally with tape recorders and spectrum analyzers by which we can measure their energy spectra and its changes with time.

The third topic, the person's hearing or sensing the sound waves, is studied in the psychophysics of hearing. This discipline understands a great deal about the sensitivity of the human ear, how it varies with the frequency of the sound, and how hearing varies from person to person. A relevant topic deals with echoic memory by which a person remembers for a few moments the exact sound heard and is then able to compare it with another similar sound a short time later. This is undoubtedly important in learning to talk because it allows the child to compare a model sound heard with an attempted imitation.

Less is known about the fourth topic, however, the person's interpreting what was heard. This involves more complex operations of the equipment in the person's head aided, in the case of the schoolboy, by structures in his head reflecting his experience in interpreting noises and his suggestive awareness that he is in a forest. We can study these processes in the hearer by observing the hearer's subsequent linguistic and nonlinguistic activity: for example the boy may say he heard a tree fall

A word of caution is needed. Although the boy might say he heard a tree fall, he might have been mistaken about the unseen source of the sound. A scientist would say more accurately that the boy sensed (3), a physical sound (2), which he then interpreted (4), as caused by a tree falling (1). As scientists we must be careful not to be misled by the ordinary way of speaking (he heard a tree fall, etc.), since this way of speaking does not distinguish between sensing and interpreting. It merely reports the result of the interpreting even though it might be mistaken. It accords with the ordinary psychological process of projection and externalization by which sounds sensed by the ears and light waves focused on the retina give rise to the illusion of not being in the head at all, but direct perceptions of the real world out there. Such perceptions, though sometimes mistaken, undoubtedly serve us well in interacting with the world.

Saying that a person heard a tree fall is also incorrect if it is understood as implying that the interpretation is somehow carried by or is inherent in or is a property or feature of the physical sound waves. Interpreting is something a person may do on sensing a physical sound and it depends on the equipment and momentary state of the person as well as on the sound heard.

The distinction between hearing a sound and interpreting it may be clarified by a further example: A runner in the Olympic games is at the starting mark. A gun is discharged and he hears the noise. With as short a delay as possible he starts to run. In this case the equipment in his head has been set to interpret the noise from the starting gun as a starting signal and to act on it as quickly as possible. If a spectator throws a lit firecracker on the track behind the runners, there may be a false start. The runners start running before they have time to interpret the noise as not coming from the starting gun.

Go!

Let us move on now to something that would normally be considered an utterance.

A schoolboy is about to start in a race. The starter says "Go!" The boy starts to run with as short a delay as possible. Here the boy is set to start when he hears a different sounding noise. We see that *different* noises may be interpreted in the *same* way. Such observations are easily replicated.

There are also clear cases of *similar* noises being interpreted in *different* ways. After dinner the boy and his sister are considering playing a board game. "What game should we play?" he asks. "Go!" she says. Here the equipment in the boy's head is set to interpret the noise as the name of a game, like checkers or chess. He does not start running with as short a delay as possible. Such observations are easily replicated.

So we have examples of different noises being interpreted in the same way and similar noises being interpreted in different ways.

If this seems paradoxical, remember that the interpretation of a noise spoken or heard depends not only on the noise, but also on the equipment in the head of the speaker or hearer and the momentary state of the speaker or hearer and how it changes reflecting the tasks in which the noise plays a part. This is where the linguistic action is.

We need no further analysis of the sound waves spoken or heard than that given by their physical measurement in acoustics and acoustic phonetics. The sound waves do not carry their interpretations from a speaker to a hearer as ancient theory would have it. To speak of sounds in a scientific context as carrying meanings is to invite continuing confusion and error.

We must thus conclude that the common conception of utterances as having grammatical structure and carrying meaning conceals false assumptions from the tradition that will not stand up to even elementary scientific examination and are in fact incorrect. We find in nature only the physical sound waves; their interpretation is entirely in the heads of the speakers and hearers. A scientific analysis must include, besides the study of the physical sounds themselves, a careful and detailed study of the people who produce and interpret the sounds and what they are doing in which the producing or interpreting of sounds plays a part.

Insulting and being insulted

Suppose there are two people, A and B. A makes a noise and B becomes insulted. Perhaps A referred unfavorably to B's ethnicity, or perhaps he simply made a loud noise with his lips. What we actually have is that A, intending to insult B, produces certain noises. In this the equipment in his head and its structuring and changes reflecting his experience and his awareness of the situation are involved. Then B senses and interprets the noise made by A and becomes insulted. In this the equipment in his head and its structuring and changes reflecting his experience and his awareness of the situation are involved. Where is the insult? It is not in the sound waves, which are quite neutral in the matter. With the sound waves alone from a tape player in an empty room, there is no insult. Neither would a tape recorder recording

the sound in the room become insulted. It takes people to do insults and other people to become insulted.

Perhaps A merely laughed. A laugh, by itself, is not insulting, but B may interpret it as a laugh and become insulted because B had just referred quite proudly to his country of origin. The laugh is interpreted as an ethnic slur. B might become insulted even if A did not even make a noise. A might have simply smiled after B expressed grief at the death of a loved one. Here we have light waves involved instead of sound waves. But a smile by itself is not insulting. Or B might even become insulted if A remained silent when B would expect a polite response. But silence in itself is not insulting.

Evidently when a person becomes insulted, some of his properties change. We know this because the changed properties can affect his subsequent communicative and noncommunicative behavior (he may complain to the other about the insult, or even strike out at him). Similarly, when a person intentionally does an insult, some of his properties change and these changed properties can likewise affect his subsequent observable communicative and noncommunicative behavior.

We cannot attribute the insult to the sound waves or the changed light waves reflecting A's behavior, (or their absence). These are quite neutral. A is either doing an insult or not and B either becomes insulted or not. Without the people involved there is no insult, or better, no insulting or becoming insulted. A may in fact not intend to insult B but B nevertheless becomes insulted, or A may intend to insult B but B not interpret it that way and not become insulted. Since it takes at least two to misunderstand, such cases require that we also analyze a system including the two of them (a linkage), which will then show properties of understanding or misunderstanding.

OK, George Washington

Suppose A says, "I'm sorry, I didn't intend to insult you." B might reply, "OK."

At a birthday party, A might say to B, "Would you like some punch?" B might reply, "OK."

Suppose the older sister at the party looks at her mother with raised eyebrows. Her mother might say, "OK," and the sister then goes to the kitchen and brings out the birthday cake.

Suppose that after the party, one of the guests is asked, "How was the party?" The guest might answer, "OK."

In each of these cases and in many others that will easily come to mind, the only thing that passes between the two people is the sound waves produced by one of them saying, "OK." Their interpretation is entirely in the heads of the people and involves changes in their properties the consequences of which may be observable.

Ordinary ways of speaking about these things are misleading and cannot be made the basis for a scientific description. The sound waves of *OK* do not have or somehow carry a meaning from one person to the other. The sound waves of speech are simply physical sound waves. Their interpretation is without exception relative

to a context in some person's head, and hence to the linguistically relevant properties of that person.

Some might argue that there are institutional ways of interpreting *OK*, and these should be taken as features or properties of the sound waves themselves. However, if many people say or interpret *OK* similarly, that is strictly a property of those people. There is always the possibility of different interpretations by different speakers or hearers, or by the same person at different times.

"Come now," someone might object, sensing a possible exception, "that may be true for *OK*, but how about proper names? Clearly *George Washington* refers uniquely to the father of our country, the first President of the United States, doesn't it?" (Other frequently cited examples are *Napoleon* and *Sir Walter Scott*.) If this really were the case, one might think that the sound waves actually do somehow carry a meaning, in conformance to ancient tradition. Not true.

There may well be other individuals by the same name. The one referred to would depend on contextual factors in the heads of the people involved. Then suppose A is in a play and refers to another actor as *George Washington*. And how about this? A tells the embarrassing truth, and B says, "OK, George Washington." We have to conclude that the sound waves associated with someone saying *George Washington* do not have a unique reference either and their interpretation also depends on contextual factors in the heads of the persons involved.

The common illusion of one-word-one-meaning apparently arises from the fact that speakers and hearers almost always interpret the sound waves of speech appropriately in context by means of processes that are quite automatic and below the level of consciousness.

A proper scientific linguistic theory ought to elucidate these automatic processes of understanding speech in context.

Jack and Jill

Bloomfield was being a careful scientist in his well-known example of Jack and Jill walking down a lane. Jill is hungry and sees an apple in a tree: "She makes a noise with her larynx, tongue, and lips. Jack vaults the fence, climbs the tree, takes the apple, brings it to Jill, and places it in her hand" (1933:22). Later Bloomfield added quite accurately, "The individuals in a human society co-operate by means of sound-waves" (1933:28).

What is really going on here, departing now from Bloomfield's subsequent account, is that Jack hears the sound waves and interprets them, possibly under the influence of his suggestive awareness of the apple tree and the thought that Jill might like an apple. In his interpretation he could have been mistaken as to what Jill actually intended in making the noise. But Jack acts on his interpretation anyway, and as scientists *we can observe his act and infer his interpretation*. We could also ask him about it. We might go further with other observations and experiments and infer something of the equipment and structurings in his head and how they operate in interpreting the noises (sound waves) of speech. We might then go on with observations and experiments and infer something also of the equipment and structurings in

the head of Jill and how they operate in the production by her of the sound waves of speech. We would be interested in what ways Jack's properties are different and in what ways similar to Jill's. We could also consider the system of the two of them and their physical environment (a linkage) and how it operates in this case to get the apple picked and into Jill's hand. Note that these are all studies of the real physical world. The linguistic properties of a person, like the person's muscular strength or immunity to mumps, are properties of a physical reality on a par with other properties of biological organisms studied in biology.

How about phonology?

A woman A moves to the Boston area from Chicago and is interested in exploring the shopping facilities near her new home. She spends considerable time trying unsuccessfully to find Carmen Street. (This is a true story.) Only later does she learn that B, who had told her about the shopping street, had been saying all along 'Common Street,' which A had heard and interpreted as 'Carmen Street.' The difference in interpretation by A and B resides entirely in the equipment in their heads and the results stored there of their experience in speaking and in interpreting the sound waves of speech, that is, in the linguistically relevant properties of A and B.

Let us now reexamine and update an example used by Bloomfield in introducing his chapter on phonology (1933:76): A linguist has a recording of an utterance which he could identify as the sound waves of someone saying *man* using two different pitch schemes. If he plays the recording to a typical American listener, the listener interprets them as two examples of what he would write down as 'man'. The linguist then plays the recordings to a listener from China. This person interprets them as different, and writes down two different things which the linguist translates as 'deceive' and 'slow.' We can conclude, departing now from Bloomfield, that since the sound waves in the two cases come from the same recording and thus are alike, the difference in their interpretation by the two listeners is entirely due to the different properties of the different listeners.

Sapir (1925) pointed out that the sound waves made by a person blowing out a candle may be identical to the sound waves produced by a person beginning to say *when*. The alleged differences between them are not in the sound waves; they are in what the person is doing. We can conclude, departing now from Sapir, that this opens the way for a treatment in the physical domain. We can develop a theory of the person that takes into account what the person is doing in terms of postulated properties of the person, some of them changing dynamically with time as the person speaks. We can then test the theory against observational and experimental investigations of the real person that are sensitive to what the person is doing.

Trained linguists know how long it takes for them to learn how to interpret the sounds produced by natives in the field and how difficult it is for them to overcome habits of interpretation learned earlier in their own or other communities. This is strong evidence that the interpretation of sound waves lies entirely in the heads of speakers and listeners. The fact that a linguist can successfully tape record speech and that a tape recorder records only the physical pressure or velocity changes in the air

and therefore reproduces only the changing energy spectrum of what was recorded is strong evidence that the sound waves themselves do not carry any linguistic interpretation, whether it be in terms of phonemes, features, words, or any other interpretation beyond the physical energy spectrum and its changes with time, which linguists have correctly insisted is never exactly the same from utterance to utterance and from speaker to speaker.

Where we stand

I think there can really be no argument or doubt about the scientific issues I have discussed here. In fact, many linguists volunteer some of these conclusions in spite of reverting to traditional conceptual structures and using terminology that presupposes that there are such things as utterances and that they have properties in themselves over and above the simple physical properties of the sound waves.

The usual concept of an utterance cannot be scientifically justified. It reflects an illusion probably arising in ancient and modern times by normal processes of projection and externalization partly under the influence of writing. We must also therefore come to doubt the scientific validity of the entire conceptual framework and system of terminology developed to talk about utterances, their parts, and their properties. We have to doubt the scientific usefulness, when associated with concepts of utterances, of such terms as *expression*, *meaning*, *word*, *phoneme*, *sentence*, *phrase*, *form*, *content*, *noun*, and many others. This casts considerable doubt on the whole enterprise of grammar, whatever its other merits, as a proper framework for a scientific linguistics.

What will take the place of these ubiquitous grammatical concepts in a proper scientific linguistics? Nothing, really, since our theories will be displaced from considering utterances and their presumed grammatical properties to considering people and their postulated linguistic properties. If you have followed me this far, you already understand something of the necessary architecture of such a linguistic science. I can now outline it for you quite briefly.

The Foundations of Human Linguistics

Science instead of grammar

In order to develop a truly scientific linguistics, we need to start by accepting *only* the minimum assumptions of all science, namely that there is a real world out there to be studied, that the real world is coherent so we have a chance of finding out something about it, that we can reach valid conclusions by reasoning from valid premises, and that observed effects flow from immediate causes.

Building on these assumptions, science studies the real world. It invents theories of the real world and tests them against observed effects flowing from real-world causes. In this the criterion of acceptance of theories is the ability of their predictions to pass tests against the real world when doubted and the criterion of acceptance of observational results is their reproducibility when questioned.

Where then is the real-world seat of the phenomena of linguistics? As we now

understand, it is in the people involved, both individually and collectively, in the physical sound waves (and light etc.), and in some aspects of the people's environment, including written records. These all exist as part of the real physical world; they are thus given in advance of our linguistic investigations and would remain were the investigators to withdraw. Their scientific study leads to linguistic theories that can be tested against evidence from these real-world objects and how they change.

It is thus straightforwardly evident that a scientific linguistics would have to:

- 1) Study people, both individually and in groups or communities of various sizes, with the aim of establishing their linguistic properties.
- 2) Study the sound waves of speech and their physical production by the vocal tract (phonetics) and their reception by the ear, and also other relevant forms of energy flow such as the light waves associated with gestures and facial expressions.
- 3) Take into account the relevant aspects of the physical environment including such objects as manuscripts, books, clay tablets and the like.

But the sound waves and other forms of energy flow and the relevant aspects of the physical environment both have their linguistic effect only through their being sensed, interpreted, and in some cases produced by people. Therefore, the linguistic study of people must become central in a scientific linguistics.

A linguistics on this model is thus a human linguistics. It accepts only the standard assumptions of all science and realizes that people are part of the real physical world. Therefore we need to develop appropriate concepts and terminology to think about and talk about and theorize about people from a linguistic point of view. Although a start has been made in this, we need all the help we can get from linguists concerned about the scientific integrity of their discipline.

Systems

It is generally known in the physical and biological sciences how to undertake a study of some aspect of the real world. One specifies the scope of a proposed investigation by setting up one or more systems. These are objects of theory defined to circumscribe and model the part or parts of the real world under study. Examples are the solar system, a digestive system, or an ecosystem. It is important not to confuse this natural-science concept of system with the quite different concept of a grammatical system.

For human linguistics we set up two kinds of systems: systems called communicating individuals that model individual persons from a linguistic point of view and systems called linkages that model groups of two or more people together with the flux of sound or other energy involved and other relevant aspects of the environment

Since communicating individuals and linkages model real people and real groups, we may well find that no two communicating individuals and no two linkages, if completely defined, would be the same. Naturally, for some purposes, we would focus on certain limited aspects of the people and groups under study and define systems that abstract away from irrelevant differences. But it is important to

understand that communicating individuals and linkages are not normative or idealized in any sense. No ideal speaker-listeners or perfectly homogeneous speech-communities are assumed. If different people show relevant linguistic differences, the communicating individuals and linkages we set up to represent them in theory will be different in appropriate respects. We have the freedom, indeed the responsibility, to set up theoretical models that correspond as closely as possible to reality so that they will be able to pass tests against observations of reality.

There are actually two orders of phenomena to be understood in linguistics: phenomena associated with single persons as they talk and understand and learn, and phenomena associated with groups of people as they interact and exhibit variation and historical change. For these two orders of phenomena human linguistics provides two different types of system: communicating individuals and linkages. It can thus also treat the influence of individual persons on the group and of the group on the individuals making it up. On the other hand, traditional linguistics offers only one theory, grammar, and this has led to serious difficulties in understanding the two orders of phenomena and their interrelations.

Properties and a notation

Systems in science are known and described by their properties, which are also constructs of theory. Thus the solar system is described by the general laws of motion; the gravitational constant; the masses of the sun, planets, and their satellites; the sizes, shapes, and orientations of their orbits; and their particular positions and motions at any given moment. We will want to describe the systems in human linguistics—the communicating individuals and linkages—in terms of their properties.

One might think that this would require a special assumption over and above the minimum assumptions of all science. But careful consideration shows that there is an observationally supported general law, the law of componential partitioning, that provides scientific justification for describing our systems in terms of properties. Such is not the case for grammatical properties in the traditional linguistics of language, which rest on a scientifically unjustified special assumption—Bloomfield's fundamental assumption of linguistics, or its equivalent.

What would properties in human linguistics be like, how would they interact, and what kind of a notation should we use for representing them? We might be tempted to assume a particular notation, say a grammatical notation, a logic notation, the notation of a computer programming language, or some other plausible suggestion. But again this would require special assumptions over and above the minimum assumptions of all science. One would ask, Why select this particular notation? But in fact we do not need any such special assumptions, for there are two additional observationally supported general laws, the law of small changes and the law of restricted causation. These provide scientific justification for a particular formal notation for representing the linguistic properties of communicating individuals and linkages and their changes as we model speaking and understanding. There is no time to discuss this notation here; it has been introduced elsewhere. To my knowledge this is the only full-scale formal notation ever developed for linguistics that has been

scientifically justified; all the other notations that I know of require arbitrary assumptions and are lacking in scientific justification.

Dynamic causal laws

From the various observations that we have discussed it is evident that any adequate scientific linguistics will have to take contextual factors into account, and that contextual factors operate directly only as part of the equipment and structurings in the heads of the people involved, that is, in their linguistic properties. Since these "contextual" factors are the changing contextual conditions in the heads of the people and operate to condition linguistic behavior and interpretations, I prefer to call them *conditional* properties; the term 'context' might seem to refer instead to the realm of text.

Now what is it that really determines what a person says or does or understands? The notation provides a means of formalizing for each property the conditions that figure in its changes and how its changes depend on the conditions. The resulting formalizations, called procedures, are specific dynamic causal laws of communicative behavior.

For each system, these causal laws are organized into what is called a *plex*. A plex is not an internal grammar, because it represents a dynamic system of causal laws. When certain properties take certain values, a given property will change in a specified way. When a person hears the sound of "Go", the person will start running, or understand a reference to a game, depending on the configuration of the relevant conditional properties.

The Scope of Human Linguistics

Thus human linguistics attempts to find dynamic causal laws that predict linguistic behavior for comparison with reality, but not only in areas paralleling phonology or syntax, but actual functional communicative behavior within its matrix of nonlinguistic behavior. It thus deals with what in the tradition would be called meaning and covers phenomena previously investigated in pragmatics. This represents an expansion of the domain of formal linguistics well beyond current syntactic theories.

What people do is in part linguistic and in part nonlinguistic. Human linguistics does not pretend to be a theory of everything or to be able to predict everything. It seeks to find lawful behavior only within its somewhat expanded domain. It does not investigate foot races, but is concerned with how starting signals play a part in foot races. If Bill wants to propose marriage to Marie, and he knows that Marie understands only French, human linguistics would predict that he would try to propose to her in French. And it would understand the significance of her reply within the context of a marriage proposal. But it would have nothing to say about why or how Bill decided to propose to her and why he chose this particular time to do it. That is beyond the scope of linguistics, perhaps even beyond the reach of science.

I want to touch briefly on several other areas and explain how they can be handled by a human linguistics.

Context

Consider literary studies. Recall that insulting and being insulted depends on the context of what the people are doing as represented in their conditional properties. The ability of human linguistics to formalize the dependence of understanding on context through conditional properties opens the way for a proper treatment of metaphor and other figurative language depending on allusions, connotations, and implications. That means human linguistics can provide strong support for literary, even poetic studies. Grammar offers poor support for literary studies.

Consider foreign-language teaching. Since human linguistics can talk about and formalize situations through conditional properties, it can support the direct spoken approach to fluency by laying out what to say or do or understand in what situation, and how the saying, the doing, and the understanding changes that situation. The traditional approach through grammar is actually seen by many foreign-language teachers as an impediment to early mastery.

Consider developmental linguistics. Learning to talk is learning what to say in particular situations and how what one says changes the situations. Since we can handle situational factors in the child's conditional properties and the child's communicative behavior within the context of a group of two or more people and their nonlinguistic activities, the way is open to understand formally how children learn to talk within the social matrix of their communicative interactions. Since human linguistics focuses directly on the child, the way is open to study both the innate and learned properties of the child and the interactions between them. A linguistics focused on language, grammar, and syntax misses the mark.

Consider the question of the representation of reality. Since human linguistics studies actual functional communicative behavior within the matrix of nonlinguistic behavior, it treats how people refer to their perceived reality, and thus how they effectively perceive it. In human linguistics the representation of reality is not a speculative philosophical question, but a question for which we now have appropriate scientific tools of investigation.

Consider the study of indigenous languages. Since human linguistics studies functional linguistic behavior within the matrix of nonlinguistic behavior, it is well suited to studying the semantic and pragmatic aspects of indigenous ways of talking and their relation to the cultural and social aspects of indigenous peoples.

Variation and historical change

Consider linguistic variation in the community, the fact that everyone speaks differently. With grammatical theories, the traditional idealization of perfect uniformity in the community gets in the way of an adequate theoretical treatment of observed variation. Human linguistics supports in its foundations the possibility of each person and each group being different from all the others. It has the built-in theoretical apparatus needed to handle observed variation in a community. This

includes variation on the basis of ethnic origin, social class, and even variation in pidgin and creole situations.

More than this, the very observation that everyone speaks differently supplies the scientific justification for the law of componential partitioning, the observationally based law on which the human linguistic concept of properties is based.

Consider linguistic variation in the individual, the fact that people speak differently in different situations. Human linguistics formalizes how what a person says depends on the situation as represented in the conditional properties. It supports different styles of talking as well as multilingualism in the individual and what has been called code-switching. It supports the taking into account formally of occupational, social, political, ethnic, and other factors such as to whom one is speaking, who else is in the linkage, and the degree of formality of the situation. It thus provides formal methods for treating variation in the individual that far transcend the narrow limitations of grammatical theories.

Consider historical change. Linguists have long emphasized that it is the people that change, not language, and that all historical change begins with the individual. Since human linguistics offers a realistic approach to developmental linguistics, and since it treats variation in the individual and what it is that determines how a person talks, and variation in the community, which affects the matrix within which the child learns and the adult adapts, human linguistics offers formal methods and has under study all the factors that lead to historical change.

Since human linguistics can formalize the function of written texts in the lives of the people who write them, it can investigate the functions of ancient texts within the matrix of the ancient civilizations, and thus what the texts may reveal about the ancient peoples.

This has been a brief sketch of human linguistics and how it provides us with a proper unified scientific understanding of linguistic phenomena. With sufficient time, I could also touch on the reasons for the illusion of greater uniformity than is actually found, the reasons for the development of formal and written standards and their treatment in a scientific linguistics, an explanation for linguistic intuitions, and why intuitions about utterances are not an appropriate primary object of linguistic research. If one really wants to study linguistic intuitions, the proper way is through a human linguistics, where they are revealed to be at best an epiphenomenon.

Human linguistics studies people, not utterances. It contrasts with the currently flourishing linguistics of language, which accepts and rests on scientifically unsupported assumptions about utterances, language, grammar, expressions, sentences, words, signs, social conventions, and the like. These are all fictions, familiar but not convenient. Their continued retention in serious theories perpetuates sheer fantasy and has prevented the development of a proper scientific understanding of linguistic phenomena. It has led to the preposterous proliferation of different versions of grammar and our inability to choose among them on scientific grounds. It has thus led to intellectual chaos in our discipline. We have been reduced to following an unexamined tradition, or the latest trend, or simply personal preference or patchwork eclecticism. We have yielded to accidents of education, to the dictates of charismatic

individuals, or to other unscientific appeals that should be irrelevant in deciding what to believe in this discipline that we care so much about.

I think you may now see why it is that if we give up grammar in favor of science in this way, we will gain more than we lose.

Selected citations and topical study guide

Ongoing discussion of issues related to moving linguistics more into science appears in the *Communications of the Workshop on Scientific Linguistics*, (ISSN 1061-4710) available from CWSL Box 150, The University of Chicago, 1010 E. 59th Street, Chicago IL 60637. This newsletter includes short articles, notes, and back-and-forth discussion of hot issues. It would be ideal for students to stimulate critical thinking and class discussion. Interested faculty and better students could submit their own points of view for possible publication here.

Other selected references to the literature, broken down by topics, are indicated in the list below. The main reference for all of these topics is the small book (1986a), which has a good index.

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On science: 1987a, 1987b, in press 1.

On systems: 1985

On the foundations of human linguistics: 1984, 1988, 1989, 1991, and most other references listed.

On the human linguistics notation: 1986b.

On handling context in human linguistics: 1986b, 1988, in press 2, and most other references listed.

On handling text: 1991.

On the representation of knowledge: 1991.

On variation and historical change: 1989.

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 - in press 2. Relativity in linguistics. *The Nineteenth LACUS Forum 1992*, Lake Bluff, IL: LACUS

INVITED LECTURES

THE POSSIBILITY OF LANGUAGE

Alan Melby with C. Terry Warner
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Foreword

This paper is intended to encourage discussion between various branches of linguistics and between linguistics and philosophy. I am not pretending to be an expert on every topic I mention in this paper. My expertise is in computers and translation. However, the issues that have arisen from my area (such as how language can possibly be non-arbitrary yet fundamentally ambiguous) need to be discussed much more widely. Even if the discussion is at first halting, and though some of us may be labelled foolhardy instead of brave, let the talks begin.

* * *

Research and development in machine translation began in earnest in the late 1940s, immediately after the first general purpose electronic digital computers became operational. The initial funding for machine translation was from government agencies interested in automatic translation of scientific articles from Russian to English. Several machine translation projects were already well-established when Chomsky's *Syntactic Structures* appeared in 1957, but none of them tried to incorporate Transformational Grammar into an existing system.

Systran, the only survivor of the first-generation machine translation systems, does not even attempt to perform a complete syntactic analysis of a sentence of source-language text into a tree structure. Even recently developed machine translation systems are not

usually based on any particular Chomskyan version of Generative Grammar, be it the Extended Standard Theory or Government and Binding. Granted, some recent systems use phrase structure trees. However, those trees are not obtained by following some specific procedure specified by Chomsky. He has made it clear from the outset that he is providing neither a model of a speaker nor a model of a hearer, but rather a model of linguistic competence. Significantly, Chomsky has never addressed the question of translation from one language to another in any detail.

One would therefore expect little connection between machine translation and Chomskyan linguistics. Nevertheless, this paper will claim that they share important assumptions about the nature of language. These assumptions impose severe limitations. Machine translation systems based on them are inherently limited in the types of text they can translate accurately. Linguistic theories based on these assumptions, including Chomskyan linguistics, are limited in what aspects of language they can deal with. I will discuss these limitations from the perspective of my experience in translation theory and practice, both machine and human, and explore alternative assumptions, bringing us into contact with issues in philosophy that have been in the background of linguistics for hundreds of years. Chomsky makes very strong claims about language acquisition, and one might ask whether the alternative assumptions we will present suggest an alternative view of the basis for the possibility of language in every normal person. We will not comment on the validity of an innate syntax faculty, but we will present an alternative for Chomsky's approach to meaning, an approach in which concept formation is more central than syntax in the acquisition of language.

But we are getting far ahead of ourselves. Let us return to 1970 and follow my personal odyssey through the landscape of language and computers until we revisit the landmarks mentioned above. The first stage of this journey will chronicle the discovery of a fundamental distinction between dynamic general language and fixed domain-specific language. This general/domain distinction will turn out to be significant to both machine translation and Chomskyan linguistics, and it will lead to a series of philosophical questions.

OUTLINE

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I. A DECADE OF PERSONAL EXPERIENCE WITH MACHINE TRANSLATION

In 1970, I was studying linguistics under Eldon Lytle, a brilliant syntactician who developed a model of language called Junction Grammar (Lytle, 1974 and 1980; Melby, 1980 and 1985). One day, Lytle received a letter from Daryl Gibb, a former graduate student, suggesting that a machine translation project be started to further explore the capabilities of Junction Grammar along the lines he had begun to explore in his thesis. Before the year was out, the project had begun and I was immersed in linguistic programming using punched cards on an IBM mainframe computer. By 1973, we had developed a particular approach to machine translation designed to facilitate the translation of general-language texts from English into several target languages, and we were interacting directly with the mainframe computer using on-line terminals. In this approach, a source text was analyzed just once by an interactive process, then it was translated automatically into several target languages, with the cost of interaction being shared over the target languages.

The interactive process of analysis consisted in running a computer program which attempted to analyze the source text but paused whenever an ambiguity was detected. The pause involved displaying a question on a terminal and waiting for a human to answer it. The human answering the questions was a native speaker of English with some training in Junction Grammar. No questions requiring target-language knowledge were permitted. The questions were of two types, syntacto-semantic and word-sense.

Syntacto-semantic questions involved aspects of Junction Grammar. Some ambiguities were straightforward to state and to answer, such as where a prepositional phrase attaches in a sentence (e.g., in the sentence *I saw the girl with a telescope*, the prepositional phrase can attach to *girl* or *saw*). Others were more subtle, such as relations within a 'referment' (the Junction Grammar version of an X-double-bar).

Word-sense interactions were of an entirely different nature. Here Junction Grammar gave us no clear guidance. Neither did we have much guidance from other machine translation projects. All machine translation projects, from the early 1950s on, recognized the importance

of 'homograph resolution', an unfortunate term which in practice simply means identifying the major grammatical category of a word as it is used in a particular sentence, for example, identifying the verb vs. adjective function of *open* in the sentence *We will open the case of oil* vs. the sentence *We will keep the open case*. Clearly, this type of distinction is essential in translation, since the verbal and adjectival readings of *open* will likely be translated into different target-language words. But just as clearly, this simple categorial resolution is not always sufficient to determine the proper target language word. For example, the word *beam* has several distinct noun senses, such as *a beam of light* and *a wooden beam*. It is not likely that several distinct senses will all translate as the same word in all target languages, and therefore categorial resolution is insufficient. And on the problem of word senses, as we will see, hang basic questions about the nature of language.

Other machine translation projects had of course encountered these same problems, but the other projects were different from ours in two respects.

First, their basic approach was designed to be completely automatic, even during analysis. We were pioneers in using human interaction in a large-scale system, following the lead of Martin Kay, who had earlier tried interaction in a very small system. Since other projects had provided no option of interaction with a human during the machine translation process, the designers either wrote their computer programs so they would choose the first possible option or so they would save multiple options, sometimes until the very end, at which time a human post-editor deletes all but the appropriate choice.

Second, they were translating technical documents. In order to increase the chances of the computer making the right choice, the designers allowed the user to select among several technical dictionaries when a text is translated, each dictionary tailored to a particular subject matter domain, such as physics or carpentry. Within a technical dictionary, a term was given just one translation, the one most likely to apply to documents specific to the domain in question. Only words that were not found in the technical dictionary were looked up in the general dictionary. This method was surprisingly effective when applied to documents written within a very narrow domain. Unfortunately, we did not have the luxury of applying this technique, since our source texts were much more general and ranged over many topics.

As noted in the previous paragraph, other machine translation systems generally allowed only one word sense per category for each domain, since they were not able to distinguish among word senses

within a category. Because we could not assume any particular domain and since we already had the option of human interaction to resolve Junction Grammar ambiguities, we naturally decided to interact on word-sense ambiguities as well. But this decision was not easy to implement. For a given word and a given grammatical category, which word senses should be listed as options? Should they be tailored to the various translation equivalents in the target language? Tailoring was not acceptable since there were several target languages, with the possibility of adding more at any time, and since economics required that the source language interaction could not be redone. Therefore, the obvious answer was to identify all the possible concepts onto which the given word can be mapped. In order to build analysis dictionary entries that would not have to be redone, no matter how many target languages we added, we decided to use only language-independent concepts and to assign a unique number to each of them. Then, we could map each universal, language-independent concept, which we called a *SEMEME*, onto just one word (or a small cluster of grammatically conditioned words) in any target language we chose to translate into.

Although the search for language-independent concept numbers now sounds to me misguided, twenty years ago we were extremely serious about the endeavor and convinced of its eventual success¹. So we embarked on five years of concerted effort to write an interactive Junction Grammar analyzer, to build up an analysis dictionary incorporating many items from the 'language-independent universal set of sememes', and to write transfer/synthesis programs for several languages. Transfer is a processing stage which maps the sememes onto target-language words and adjusts syntactic relations. Synthesis maps the tree onto a surface string in target-language word order with target-language inflections. The phases of analysis, transfer, and synthesis (sometimes called generation) are standard in machine translation. What distinguished our project was the use of Junction Grammar, the attempt to obtain high-quality output in several target languages from general-language source texts, and the use of human interaction during analysis.

I remember a conversation I had with Richard Kittredge during this period. He was the director of the machine translation project at the University of Montréal, and he suggested that our project was overly ambitious. I assured him that thanks to the power of Junction Grammar and the technique of using human interaction for the moment (with the goal of gradually reducing it to a negligible level or better yet, eventually eliminating it through intelligent programming), we were guaranteed to achieve success.

The syntacto-semantic side of our project went well. Junction Grammar developed into a coherent, fairly comprehensive model of the syntactic structure of language. The word-sense side was a disaster. As the dictionary got bigger and bigger and we ran more and more texts through the analyzer, it became harder and harder for native speakers of English to decide among the word-sense options listed for a given word. Often, they would say that a word was used with a sense somewhere between two listed senses but not right on either one. Often, they would say that an entirely new sense was needed, not like any in the list. And often, even if they chose a word sense from the list, the transfer/synthesis program would not produce an appropriate target-language word. The transfer/synthesis designers would complain that the analysis people were not choosing word senses consistently.

By 1978, we had reached a crisis. The system was not working (that is, the unfortunate need for heavy postediting was recognized) and drastic action was in order. Some favored adding interaction to the transfer phase. But this was not an acceptable solution to me, since it required a bilingual human (actually, a qualified translator) for each target language and since it did not answer the question of how to identify language-independent universal sememes. This was when it suddenly occurred to me that although concepts certainly exist in some way, the real problem could be that the 'language-independent universal sememes' we were looking for do not exist! Seldom in a person's career does such a complete change in world view take place. I had a degree in mathematics. The world was supposed to be a nice, tidy place. It was hard for me to admit that our approach to word senses was dead wrong. It was not just a matter of trying harder. I eventually became convinced that no amount of effort would patch up the system as we had designed it. The approach was simply wrong-headed.

My view of language and the world had changed. I had become convinced that what we had been looking for, THE universal, language-independent set of sememes, did not exist. I started asking myself about the status of sememes. What was the justification for believing in them? It seemed to be an unsupported assumption about ambiguity: just because some ambiguous terms could be reduced to a limited set of distinguishable word senses, we had supposed that all words could be. But this reasoning is circular, for as I realized subsequently, the idea of sememes in itself entails the doctrine of total reducibility of meaning to language-independent atoms. When we map general language onto word senses, supposing these senses to be limited in number, we leave true creativity behind. All meaning becomes mechanical combinations of atomic word senses. Once this work is completed, we would THEORETICALLY arrive at the single correct, language-independent all-

encompassing basis for viewing, that is, categorizing the world from which all individual views would be derived. But this 'single view of the world' position is another version of the assumption about language-independent sememes. This position has implications which, upon later reflection, I have found horrifying. Did we have any support for taking this position other than the circular argument I have mentioned? I cannot find that we did, except possibly that it was necessary to the design of our machine translation system.

I emphasize here that at the time, my objection to the view I abandoned included no high-flying reasoning. What brought down my naïve faith was an intuitive realization that the search for the final determinate set of sememes was futile, obviously in practice but, I suspected, also in principle. I was beginning to sense that language is dynamic and ambiguous in a deeper way than I had ever supposed, and that there is not just one built-in, correct way to view the world.

The futility of searching for universal, language-independent sememes could explain the failure of our project. However, certain other machine translation projects had been successful. Why were they successful? I had already noted differences in approach. Upon comparing their design and objectives with ours, I observed the following: Our project had the design requirement that (1) it must produce high-quality translations (indistinguishable from competent human translations) of general texts; and (2) human interaction in analysis was allowed, but little or no post-editing was permissible. It turned out that no other project anywhere in the world was able to satisfy those requirements. So their design requirements were obviously different. Hopefully, reviewing those differences would lead to an understanding of why our requirements were unrealistic.

One variable objective for certain projects was that high-quality output was not required. This was in the context of end-users who were only interested in getting a rough idea of the content of a document, perhaps in order to decide whether a human translation was called for. In this case, the post-editing would sometimes have taken longer than regular translation, but since raw output was useful, little or no post-editing was done. This difference was not enlightening, since we were also able to produce low-quality machine translation.

The design of our project differed significantly from that of other projects in the nature of the source text. We were not able to restrict the source text to a single, well-defined domain. However, in the case of my colleague Richard Kittredge at the University of Montréal, his team was able to produce a successful machine translation system, a version

of which is still in use today, by restricting the source text to Canadian weather bulletins. The weather bulletins did not talk about the price of eggs. They did not discuss how to brush one's teeth. They just described the weather in Canada. This difference eventually pointed to an explanation of why our objectives were so much more difficult to attain.

II. TWO KINDS OF LANGUAGE

By 1981, I had left the machine translation project and had begun studying human translation. I was suddenly fascinated by human translation in its own right, since skilled human translators were doing, and had been doing for thousands of years, something which no machine translation project had been able to do—produce high-quality translations of a variety of general-language texts. I decided to try an inside-out approach. I 'became a translator', at least in the sense that I passed the accreditation exam (for French into English) and became a member of the American Translators Association. I even did some translation of articles on linguistic theory and contracted with a company to supervise the translation of a software manual into French. I also became very much engaged in the task of designing and programming productivity tools for human translators. Having been deeply committed to a certain view of machine translation and having been humbled by admitting that that view was in error but not having embraced a new view, I was prepared to see language in new ways.

A. General Language vs. Domain-specific Language

All through this period of the 1980s, I searched for a better understanding of what was wrong with the idea of a list of universal, language-independent sememes. Gradually, it dawned on me that within a well-defined domain—and I want to emphasize this restriction—this assumption of a list of domain-wide, language-independent sememes was not far off. Each concept of a domain is normally associated with just one technical term per language. And in a standardized terminology file, each concept often has been assigned a unique number (as in our list of sememes). This was exactly what we were trying to do for general language. So what was the difference? An answer struck me forcefully! **THE CONCEPTS OF A NARROW DOMAIN AND THE CONCEPTS OF GENERAL LANGUAGE ARE OF A FUNDAMENTALLY DIFFERENT NATURE.** At first, this seemed too strange to be true. Technical terms were thought to be just a subset of general vocabulary. However, on this new view, the

general vocabulary of a language would form a language-specific semantic network, and each well-defined domain would have its own network, which may be shared across languages. In other words, there would be two fundamentally different kinds of network: general-language networks and domain-specific networks. This insight had overwhelmed me by 1989. If correct, it might explain much about when machine translation succeeds and when it fails. The next few years became a time to look for evidence for or against this general/domain distinction and to explore its consequences.

B. The Search for a Cover Term

Immediately, I realized that most texts consist of mixtures of general and domain-specific items. I say *item* because *word* does not fit too well for technical terms, especially noun-noun compounds. One piece of indirect evidence for a distinction between these two kinds of item came through the innocent search for a cover term for the two kinds. I have colleagues in the world of professional lexicography (makers of general dictionaries) and colleagues in the world of professional terminology research (translators and terminologists), and so I thought it would be a simple matter to talk with both groups to come up with a cover term that could refer to both words of general vocabulary and terms (which can consist of several 'words') from a technical domain. Not only was it not a simple matter, but in the unsuccessful process of trying to find a cover term acceptable to both, I discovered how different the two traditions are. 'Word' is acceptable to lexicographers but not to terminologists. 'Term' is the other way around. 'Lexical unit' came close, but was rejected by the terminologists. I finally gave up and started using Lexical/Terminological Unit (LTU), which is not a true cover term but rather a composite term.² Looking for cover terms for similar items is not too difficult. A cover term for *rose* and *tulip* is obviously *flower*. But a cover term for *rose* and *hammer* that is not so general as to let in all kinds of other items (*object* would clearly be too general) might end up being a composite (such as 'flower/tool'). Thus, the lack of a cover term for *word* of general vocabulary and technical *term* suggests a substantial distinction.

A piece of evidence that terms are not just a subset of general vocabulary is the fact that there are more terms than words. An unabridged English dictionary, which lists headwords from general vocabulary as well as many technical terms, may have half a million entries, but **THERE ARE SEVERAL MILLION TECHNICAL TERMS IN ENGLISH**, many of them being noun-noun compounds and acronyms.

Before continuing, I must point out that when we look at texts, we find a continuum. There are various mixtures of lexical units and terminological units. Suppose we think of clay and stone³ as physical materials somewhat analogous to lexical and terminological units. A word is thus a piece of malleable clay and a term is a stone. Starting with the extremes, a text consisting solely of general vocabulary would be a sequence of pieces of clay. The particular sequence of particular shapes may never have occurred before, even if the same words occurred previously, since the words are dynamic and their meanings shift all the time, in different situations, just as the shape of a piece of clay changes as you work it. On the other hand, a text from a very narrow domain, such as the domain of weather bulletins mentioned above, would be a sequence of stones, consisting almost entirely of terms, with little general vocabulary and no dynamic usages. There is no literary creativity needed, even if the particular weather bulletin has never been issued before. Each term has a fixed and consistent meaning. In the United States, *storm watch* and *storm warning* are used consistently from bulletin to bulletin, just as one would want them to be.⁴ In the far extreme case, even prepositions and other function words can be terms when they are highly 'restricted' in their allowed usage. The two extreme cases, texts consisting solely of general vocabulary and texts consisting solely of terms, are rare. In between the two extremes, there is a vast territory of LSP (Language for Special Purposes) texts which consist of a mix of clay and stones. It is also likely that there are LTUs which are in between soft clay and hard stone, such as terms which are not yet stable and words which are 'recycled' terms (such as *interface*). Therefore, a particular sequence of letters (such as *i-n-t-e-r-f-a-c-e*) can be a word in one situation (referring to the way people relate to each other) and a term in another situation (referring to a conversion of computer data between formats). However, in my view, the continuum between a very general text and a highly domain-specific text is NOT a gray-scale along which words gradually become terms and terms gradually become words. The mix may change, but usually words are words and terms are terms, and different processing applies to each. The two analogies, a gray-scale vs. a clay/stone mixture, have very different implications for the computer processing of language. A gray-scale analogy would imply that techniques applicable to terms can gradually be extended to apply to words. A clay/stone analogy, as proposed here, implies that techniques that apply to stones will never work for clay. New techniques will have to be developed.

C. Fundamental Ambiguity vs. Superficial Ambiguity

In this paper we will distinguish between superficial and fundamental ambiguity. Both types of ambiguity involve the traditional notion of multiple word senses for the same string of characters. Terminological units ('stones', according to the previous analogy) exhibit only **SUPERFICIAL** ambiguity because in a well-defined, narrow domain there is a relatively stable, finite inventory of concepts that are mapped to a given LTU, and, in a given situation, the LTU means exactly one of those concepts (except for puns, a rarity in domain-specific text, where it means two simultaneously). On the other hand, when there is not a stable, finite inventory of concepts associated with an LTU (that is, when dynamic, unpredictable meanings are created as needed in new situations), we will say the LTU exhibits **FUNDAMENTAL** ambiguity. Thus, fundamental ambiguity involves two levels of ambiguity: (1) a superficial ambiguity between a given LTU and two or more concepts that map to it; and (2) a second, deeper, dynamic ambiguity between the world and the concepts associated with an LTU.

This distinction is related to the issue of whether there is a comprehensive list of language-independent universal sememes. I have said there is no such list and therefore that there is fundamental ambiguity in general language. There may well be a language-independent set of principles that describe the physical properties of matter at subatomic, atomic, and molecular levels, but this does not necessarily imply that all concepts of human language are built up mechanically from physical principles. If some concepts are not built up mechanically from universal principles, then where might they come from? That question will be explored more seriously in later sections (starting with Section VIII on traditions in Western philosophy). For now, we will merely give an informal introduction to the issue of whether there is fundamental ambiguity in language.

In our work on machine translation in the 1970s, we were able to maintain our belief in a comprehensive list of language-independent sememes over a period of several years of intensive work. If this presumed list does not actually exist, then how were we able to maintain a belief in it? One reason is that for any specific sentence in any specific text, one can, in retrospect, define a sememe that maps to each word. The problem is that for many words, the list of all possible sememes mapped to a word cannot be established in advance. This does not imply that meaning is random; meaning is dynamic and always motivated (at least in hindsight). And this dynamic aspect of meaning is the basis for fundamental ambiguity. For example, take the word *dust*. *Dust* can be a noun or a verb. As a verb, it can mean to take off

dust, as in *dust the furniture* or *dust the plants in the living room*. But in the fields, *dust the crops* might mean to put pesticidal dust **ON** the plants. In a novel or in an editorial, an author might create a new meaning for dust, such as 'to reduce to dust'. There is no predetermined list of possible meanings for dust.

Recently, I saw a bottle marked *tamper evident*. At first, I wondered whether it meant that someone had evidentially tampered with the bottle. Then I realized that it meant that it should be evident to the user whether the bottle (in this case, a bottle of medicine) had been tampered with prior to purchase. Suddenly, a new meaning had been created for me. Then I saw another bottle which sported the phrase *body building*. Having worked as an instructor in a fitness center during high school, I immediately wondered what the bottle (in this case, a bottle of shampoo) had to do with weight lifting. Then I realized that it meant that the shampoo was claimed to increase the 'body' or bulk of one's hair. There is a subtle shift in the meaning of *build* in the two senses of *body building*. Is there a finite, pre-determined list of possible meanings of *build*?

Then, I ran across a text by Pourtales (1966) which gives some background to the time when Berlioz wrote *La Symphonie fantastique*. Pourtales writes that Berlioz *buvait le temps comme les canards mâchent l'eau* (literally, drank time like ducks chew on water). This introduces a new concept for drink which is not likely to be in a dictionary.

Continuing with animals, we can imagine that an author could call an automobile a dog. In context, this could mean that it is unstable on slippery roads, essentially wagging its tail like a dog. Is there a limit to future metaphorical meanings of *dog*?

In the next section, we see that the word *run* has an essentially infinite set of meanings and is asymmetrical with respect to French. All good literature is full of subtle new meanings created just to give flavor to a particular text. And the further we go from concrete words like *dog* toward abstract words like *good*, the harder it is to claim that there is a finite list of well-defined concepts associated with every word. If there is some word for which there is no finite list of well-defined concepts, then there is something beyond superficial ambiguity.

One might argue that each new meaning for a word is simply a mechanical combination of other concepts, that there is literally nothing new under the sun. If this is so, then there might be words that exhibit more than superficial ambiguity in that one cannot list all possible

meanings in advance, while there is no fundamental ambiguity as we have defined it here, since there might be a stable, finite set of building-block concepts from which all others are mechanically derived. In this case, all possible viewpoints (categorizations) would be derived from one underlying set of concepts, and with sufficient knowledge, one would expect to completely understand anyone else's viewpoint. On the other hand, if there is fundamental ambiguity in language, there may be mutually incompatible viewpoints that are all consistent with the same physical world. Here we are touching on the issue of the grounding of language, which will be explored later in the paper. Each reader will have to form a personal opinion on where concepts come from.

The rest of this paper can be viewed as an on-going discussion of fundamental ambiguity. The next section argues from several directions that there is a significant difference between domain-specific language and general language. In the background is the argument that a convincing general/domain distinction would make it more plausible to suppose that general language exhibits fundamental ambiguity. A negative way to put the argument would be that if there is no fundamental ambiguity, then why is general language so hard to process and why is there such a strong difference between general and domain-specific language? Later sections suggest connections between mainstream Chomskyan linguistics and the general/domain distinction. This will lead to an analysis of Chomsky's position on fundamental ambiguity. A look at Lakoff's work will suggest that the general/domain distinction may be related to 'experientialism' vs. 'objectivism'. Objectivism (including theories built on it, such as Chomskyan linguistics) is a philosophical stance which implies that there is no fundamental ambiguity, so we will then look at various traditions in Western philosophy in search of one that will allow for fundamental ambiguity. We will conclude with an introduction to an approach based on the work of Levinas which allows for fundamental ambiguity without claiming that meaning is random. In the final analysis, one cannot prove the existence of fundamental ambiguity (since acceptance or rejection of fundamental ambiguity is a starting point rather than a conclusion), but we hope to suggest that it is plausible and that it provides a basis for the distinction between general and domain-specific. So now I return to various arguments for the general/domain distinction.

III. SOME EVIDENCE FOR THE GENERAL/DOMAIN DISTINCTION

To this point I have suggested that there is an important difference between words and terms, or, as I have called them, lexical units and terminological units. And I have claimed that most text we encounter in real life consists of a mixture of words and terms. We will now look at three kinds of evidence for the word/term distinction. This evidence is intended to support the general/domain distinction, since if there are words which do not qualify as terms, then at least some part of language is not domain language and there is a distinction. (A) We will look at a few examples of LSP text for evidence of dynamic use of general vocabulary (words) mixed with more static terms. (B) Then we will look across languages for words whose meanings are not reducible to a list of separate senses. (C) Finally, we will look at the history of computer processing of natural language for evidence that certain techniques apply only to domain-specific text.

A. Some Examples of Dynamic vs. Static LTUs in LSP Text

We will now look at a few examples of LSP (Language for Special Purposes) text and look for words, especially words that have dynamic meanings, to illustrate differences between the properties of words and terms.

There is a huge volume of LSP text. It is everywhere around us. Just by looking at a few pages of the December 1991 issue of *Byte* magazine, the following examples of LSP text were found:

Example 1

'The quality of IEF-developed systems is remarkable. In recent CASE research by the Gartner Group, application developers were asked to report the number of abends they had experienced.'

The first sentence follows the pattern: The x of y-developed systems is z. Here x is *quality* (a word of general vocabulary), y is *IEF* (a term which expands to Information Engineering Facility (tm)), and z is *remarkable* (another word of general vocabulary).

The second sentence has a more complex syntactic pattern containing four 'stones' (terms): 'CASE' (a term which expands to Computer-Assisted Software Engineering), 'The Gartner Group' (a term which is a proper noun), 'application developer' (a term which means

someone or some group that writes computer software application programs), and 'abend' (a software term which means abnormal termination).

In this two-sentence passage of LSP text, there are no truly creative uses of language. A very sophisticated NLP (Natural Language Processing) system could probably process it well.

Example 2

Now consider another passage from the same magazine:

'Double Your Clock Speed, Double Your Fun'

'Intel has developed a new technology for doubling the internal clock speed of its 486 and 486 SX processors. The clock doubler will boost the speed of the CPU (e.g., revving a 25 MHz processor up to 50 MHz) and this improves overall performance without requiring big changes in the rest of the system.'

This passage of LSP text contains some units of dynamic general language. Granted, it contains several static technical terms (such as 'clock speed', '486 SX', 'CPU', and 'MHz'). But consider the title 'Double Your Clock Speed, Double Your Fun'. If understood and translated literally, it means that you will have twice as much fun if the clock in your computer runs twice as fast. Of course, this is false. Doubling clock speed does not necessarily double throughput and even if it did, your boss would probably not let you leave work early to have more fun just because your computer runs faster and you get more work done. A literal translation, which lets the reader figure out what it might mean, may or may not be acceptable. An intelligent human translator who does not know the pun behind this title (see below) would probably interpret the title in a reasonable way and translate it as something like 'faster clock speed makes work more enjoyable'. A standard machine translation system, on the other hand, has no way to decide when a passage should be translated literally and when it should be adapted, let alone decide how to adapt it. In addition, this title cannot be fully processed unless it is identified as a variant of an advertising slogan for an American chewing gum. The original slogan was 'Double your pleasure, double your fun, with Double Mint . . . gum'. The knowledge domain of microcomputers does not include information about chewing gum. And although only one small piece of information is relevant to the interpretation, it is impossible to predict in advance (i.e., before seeing the passage) that chewing gum will be relevant. And even when

that piece of information is accessed, it is still not obvious how the title should be translated into a language environment which does not know about the American chewing gum advertisement.

Another difficulty is the term 'clock doubler', which is a new term devised to describe this new technology. An NLP system for LSP texts must include a mechanism for quickly and easily adding to its lexicon new terms that are found in the text being processed. This becomes especially difficult for terms like 'clock doubler' in which both component 'words' (or 'items') might already be in the lexicon. The problem of accurately recognizing multi-item terms has been worked on for years and is unsolved.

The verbal phrase 'to rev up' is borrowed from the domain of automobile engines and is dynamically applied to CPUs. It is not obvious that the corresponding automotive phrase in another language will work well in this situation. This is where a human translator uses judgement and creates a new metaphor in another language, selecting expressions in the target language that are equivalent in sense and pleasing to the speaker of the target language.

Another item of general language that could cause problems is the word *big*. It is being used in the sense of 'significant' rather than large, but it is not obvious how this is to be determined by an NLP system.

B. Evidence from Studies of Asymmetry

We could continue indefinitely with examples of dynamic general language in LSP and general texts. They are found in almost any magazine or book, except perhaps the most boring and predictable. Some people might be satisfied with such examples as evidence that terms are basically different from words. Others may require additional evidence. The use of the word 'evidence' is not intended to imply rigorous proof. A distinction as fundamental as the general/domain distinction is likely not provable. But if one is willing to consider it a possibility, then one can find considerable supporting evidence.

Words and terms use the same alphabet, which obscures any obvious surface-level difference when looking at an LTU in isolation. But it occurred to me that contrastive analysis might yield further evidence, even at the LTU level, as opposed to studies of longer segments of texts. In 1989, at the invitation of Professor Jean-Marie Zemb of the Collège de France, I embarked on a study of cross-language

asymmetry of words and terms.⁵ Following are some of the results of that study.

When a unit of language is claimed to be associated with a general semantic network, I will call it a lexical unit, whether it is a single word or an expression. When a unit of language is claimed to be associated with a domain-specific network, I will call it a terminological unit. When I do not want to make either claim or do not want to make the distinction, I will use the term LTU (lexical/terminological unit) introduced above.

As our window into the nature of semantic networks, I will use relative symmetry or asymmetry of LTUs between languages.

Two LTUs (one in language A and the other in language B) will be said to be perfectly symmetrical if each LTU is equivalent to the other and only to the other. For example, within the domain of solar energy, the English LTU *heat loss* and the French LTU *déperdition de chaleur* are symmetrical. There are actually international standards which set up symmetrical LTUs in certain well-defined domains. In mathematical statistics, International Standard number 3534 specifies that *bivariate distribution* is equivalent to the French term *loi de la probabilité à deux variables* and that *standardized variate* is equivalent to the French term *variable aléatoire réduite*. The cross-language link between symmetrical terms looks like a ping-pong ball bouncing rhythmically back and forth between two skilled players, each cooperating in making it possible for the other to stand still and hit the ball every time.

Our methodological assumption will be that a pair of symmetrical LTUs indicates that they are linked to symmetrical nodes, or even to the same node, in one semantic network or two closely linked semantic networks.

Pure symmetry becomes boring very quickly, so I will concentrate on examples of apparent asymmetry of semantic networks, as evidenced by LTUs which do not have a one-to-one correspondence between languages.⁶ If terms are symmetrical, then asymmetry may be evidence of LTUs that are not terms.

B. 1. Asymmetry of Homographs

One easily observed type of asymmetry occurs when an LTU is a homograph. When an LTU has two very distinct, possibly unrelated senses, there will almost always be two or more equivalents in another

language. For example, the English LTU *bank* has two very different equivalents in French, *banque* (financial institution) and *rive* (mounded dirt at the edge of a river).

The demonstration of asymmetry consists of the following steps:

(1) French LTU *banque* is equivalent to English LTU *bank*.

(2) English LTU *bank* is equivalent to French LTU *rive*.

(3) Symmetry would imply that the French LTUs *banque* and *rive* are equivalent.

Since the conclusion is clearly false, we have an example of asymmetry.

This asymmetry of homographs is easily repaired. Simply number the homographs *bank*₁ (financial) and *bank*₂ (river) as is commonly done in general dictionaries. Then the demonstration of asymmetry has been countermanded since *banque* is equivalent to *bank*₁ but *bank*₁ is not equivalent to *rive*.

As a comment in passing, we note that homographs are not always entirely unrelated. An examination of the etymology of the two senses of *bank* mentioned above reveals that they both derive from 'raised shelf or ridge of ground' (Oxford English Dictionary, 1989, pp. 930-931) The river sense is literally a mound of dirt. The financial sense came from a money-changer's table or shelf.

B. 2. Asymmetry of Evolving Word Senses

We will give one example of the asymmetry of word senses caused by cultural change. In recent years, more and more men and women wear a pouch which is attached around the waist with a belt. Originally, such a pouch was usually worn in the back. Somehow, it became called a *fanny pack* in the United States and a *bum-bag* in England, probably because of cultural differences between *bum* and *fanny* (both referring to one's anatomy). *Fanny* is highly offensive in England. These pouches, which have been worn by French men longer than they have been worn by British or American men and women, are usually worn on the side in France, rather than in the back. This practice is catching on in the United States, where they are now often worn by both men and women in front or to one side. The French LTU for such a pouch, *banane* ('banana'), is not predictable from the English

LTUs, although it is certainly motivated by the shape of the object (somewhat like a very fat banana). Now here is the difficulty. When Americans first started wearing fanny packs on their side, they were no longer 'fanny' packs. But some people continue to call them *fanny packs*. Their newness creates a tension. Sometimes people do not know what to make of a pouch worn on the side and they will call it anything from an overgrown coin purse to a tiny briefcase. *Pouch* and *banane* are not symmetrical since pouch is too broad and *fanny pack* and *banane* are not fully equivalent. Given the current high level of international trade and travel, within a few years we may see a new LTU in English, more specific than pouch and equivalent to *banane* in that it does not specify where the pouch is to be worn (front, back, or side). This will resolve the temporary asymmetry.

B. 3. Asymmetry of Holes

An interesting type of asymmetry is observed in cases where an LTU in one language has no corresponding LTU in the other language being considered. For example, take the English LTU *nut*. If we ignore the homonym of *nut* which means a device for attaching a bolt and instead focus on nut as a family of edibles including peanuts, cashews, and almonds, we may be surprised to discover that there is no corresponding LTU in French.⁷ For each specific kind of nut, there is an apparently symmetrical LTU (*cacahuète* for 'peanut', *cajou* for 'cashew', *noix* for 'walnut'). However, there is no generic French LTU corresponding to the English LTU *nut*. If one insists, there is a scientific term in French, *fruit à écale* (literally, 'fruit with a shell'). But this technical term is not used in everyday conversation. The French LTU *noix* may also suggest a more general center or kernel, but is unlike the English *nut* in that it is directly associated with a particular kind of nut.

Another example of a hole is the lack of a simple French equivalent for the English LTU *chicken*. In English, there are female chickens (hens) and male chickens (roosters). Granted, in English, chickens are assumed to be hens by default, but we say *chicken coop* when a rooster is present, not *chicken and rooster coop*. The French LTU *poule* almost works for *chicken*, except that it definitely excludes a rooster. Thus, we might define homographs for male chicken and female chicken. However, it is not as simple as that. In French, once the bird is dead and prepared for cooking, both a rooster and a hen can be called *poulet*. Given the importance of fine cuisine in French culture, it is not surprising that there are even more complications with *chicken* than those just mentioned.

There are many examples of holes. Some on which we will not elaborate are the asymmetry between the English LTU *potato* and corresponding LTUs in French and Japanese (for example, the Japanese word *imo* is a class that includes more than potatoes and does not correspond to any English LTU). There appears to be a hole in French and some other languages relative to the English concept *pet*, for a domesticated animal. Other holes are closely tied to culture, as is the pouch example above. For example, French bread and American bread are not at all interchangeable without complaint.

The study of asymmetry of holes is interesting, but it is not evidence of a basic asymmetry between semantic networks. So long as there is symmetry at a more specific level, we can posit nodes in a semantic network that are not associated with any LTU (such as the non-LTU node for *nut* in French) but which do not block communication since one can always use one or more specific LTUs to replace a more generic LTU in a given situation.

B. 4. Asymmetry of Subdivisions

When you take apart an object with well-defined pieces, such as an alarm clock, there is seldom disagreement on how many pieces there are. However, when you butcher a steer, there are several methods of dividing up the meat, depending on what country you are in. Multiple methods produce an asymmetry of subdivisions.

Another asymmetry of subdivisions exists between English and Japanese in the ways to say 'thank you'. The Japanese distinctions are hard for an American to grasp, but they involve such factors as whether the person being thanked was obligated to do what was done, how much effort was put forth, and whether the 'thank you' is in response to a compliment. Even between English and French there is a strong asymmetry concerning *thank you*. When an American receives a compliment, a normal response is 'thank you'. But a French speaker would never say 'merci' in response to a compliment.⁸

These asymmetries of subdivision are complex, but they are not the most intractable. At least there is a well-defined cow to be subdivided and at least there may be a well-defined list of possible Japanese equivalents to *thank you*.

B. 5. Dynamic Asymmetry

A basically different kind of asymmetry of subdivision is encountered in the French LTU *geste*. There is no simple English LTU which corresponds to *geste*. The English LTU *gesture* would only be appropriate in some situations. In the French expression *faire un geste de la tête*, *geste* does not match with *gesture*, since the whole expression means to shake one's head. There is no rigid list of possible ways to use *geste*, and even a partial list brings in English equivalents which go beyond *geste* on the way back to French. For example, *geste* introduces *shake* in English, but *shake* has equivalents in French which are not equivalent to *geste*.

Now we have encountered a fundamentally different kind of asymmetry. There is no official list of all the possible ways to use *geste*. The moment one thinks such a list has been completed, another usage will pop up in a conversation, a novel, or an editorial or any other piece of general language.⁹

Another example of asymmetry of subdivisions is the English LTU *run* and its French equivalents. A general French equivalent of *run* is *courir*, but this does not always work. In French, you do not use *courir* when you run for political office. And you do not use *courir* when you run a machine. There are hundreds of documented expressions in which *run* is equivalent to many LTUs other than *courir*. If there were a fixed number, however large, everything would be all right. The problem is that one cannot foresee all the situations in which *run* will be used. And the next new situation may result in a creative translation equivalent different from any encountered so far or an unpredictable (but motivated) choice among existing options.

There are many, many examples of this 'dynamic' asymmetry among words of general language.

Of course, that which was at first dynamic becomes static when it is repeated. Technical terms are sometimes new words created for the occasion, such as *laser* (which may have originated as an acronym for 'light amplification by stimulated emission of radiation'), and are other times existing words which take on new meanings (such as *mouse* when used to refer to a pointing device for controlling a computer). The two meanings of *mouse* are then two separate LTUs, one a word and the other a term. Most often, they are combinations of existing words which take on a new meaning as a unit, forming a multiword technical term such as *disk drive*. Certainly, there is a connection between the two lexical units *disk* and *drive* of general vocabulary and the

terminological unit *disk drive*. The *disk drive* is a device that 'drives or 'controls' a 'disk' covered with some material (usually magnetic or optical) for storing digital information. The point is that when *disk drive* was first used it was a dynamic unit of general vocabulary with a motivated but not totally predictable meaning. Then it made a transition from 'specialized' general vocabulary (an intentional oxymoron to emphasize the unstable nature of this stage in the life of a term) to the domain of computer technology.

For a time, after the creation of a new technical term, there is a strong asymmetry (namely a hole) compared to other languages spoken by those who share the same domain of technology. A new term is created within general language and passed to a domain; then, equivalent technical terms are formed in other languages and passed to the same domain. In the interim, the technical term from one language may be used temporarily in another. For example, the English term 'software' was used in French; then the French term 'logiciel' was created. Now the two terms coexist and compete.

When new meanings are formed and survive in a domain, there is a tendency toward symmetry between languages. It takes a certain energy for a term to remain in use. If it has enough energy, a cluster of symmetrical terms appear. If it does not have enough energy, then it will disappear. But it does not take on new meanings dynamically from within a domain. This would be antithetical to the goal of clear communication on technical topics. People want terms to be predictable.

On the other hand, words of general vocabulary are more like wild horses. They do not want to remain stable in their meaning. At some point, the English lexical unit *run* took on dynamic meanings when it was first used in each of the following situations: *money ran through his fingers*, *the river ran dry*, *the colors ran riot*, *the play ran long*, and *the colors in my shirt ran*. At each of those points, the French equivalent for a dynamic meaning was NOT predictable. Each may now have become predictable through repeated use, but that does not change the fact that a new use of *run* may pop up at any time, and there is no way to reliably predict how that new use will be expressed in another language.

Geste and *run* are not rare examples. One could go on indefinitely pointing out fundamental asymmetries between any pair of languages that are not close enough to be borderline dialects.

B. 6. Summary of Observations about Asymmetry

We have now observed, using studies of relative asymmetry, a crucial difference between general LTUs and domain-specific LTUs, and we infer from this a difference between general and domain-specific semantic networks. Nodes in general networks are able to produce dynamic meanings as needed without creating new words. Nodes in domain networks are more stable. When a new term is needed, it is created using the dynamic processes of the general network, as a new word or a combination of existing words. If the new term survives, it becomes a node in a domain network.

Now we begin to see a basis for my experience in machine translation. General-language LTUs have a kind of fundamental asymmetry across languages. This implies a fundamental ambiguity of concept formation. Even technical terms may be asymmetrical across language if the domain of knowledge is not shared by the languages in question.

If LTUs were associated with one or more language-independent sememes in a pre-determined list, one would expect asymmetries to be as easy to resolve as homographs.

One can create a language-independent concept by specifying a certain context within general language (a domain), but one cannot create dynamic meanings where no fundamental ambiguity exists. If all LTUs were like terminological units, there would be no dynamic meanings and thus no truly general language. If all LTUs were like lexical units, there would be no well-defined domains.

C. Evidence from the History of NLP

There are other kinds of evidence for a fundamental difference between general and domain-specific language. Take, for example, the past thirty years of work in NLP, including the artificial-intelligence (AI) approach. In the 1960s, computers were viewed by the general public and widely described in the press as electronic brains. AI researchers often made strong claims about what progress would surely be made in AI during the coming twenty years (that is, by the 1980s). Particularly vocal among them was Marvin Minsky of MIT who repeatedly claimed that within twenty years computers (perhaps special purpose computers) would be capable of every human intellectual activity. The main difference between computers (silicon machines) and humans ('meat'

machines), he proposed, was that computers would do everything faster and better.

In the past thirty years (allowing an extra ten years for miscalculations in Minsky's estimates), we have seen some spectacular successes in computer processing of language, but not exactly the ones predicted (Dreyfus, 1992).

C. 1. Machine Translation

As already noted, automatic machine translation has produced high-quality output only when the source text is restricted to a narrow domain. For example, Xerox corporation uses machine translation for many of its maintenance and repair manuals for photocopiers. Technical writers are trained in using a simple, unambiguous style that avoids constructions that have proven problematical for the machine translation system they use. Terms are strictly controlled and stored in a terminological database. The documents to be translated are concerned solely with the very narrow domain of Xerox photocopiers. Therefore, the machine translation dictionaries can be tuned to this narrow domain, and any translation equivalent that does not apply can be eliminated.¹⁰

The difference between a machine translation system that works well and one that works poorly does not seem to be directly related to the size of the dictionaries (unless one is talking about a 'toy system' with dictionaries of only a few hundred words). If the domain is sufficiently narrow and the source texts are grammatical and consistent, there can be hundreds of thousands of terms in the dictionaries with excellent results. On the other hand, no system in the world does well on general text, even with a vocabulary of under fifty thousand words. This certainly suggests a significant difference between words and terms.

I hasten to add that I am making no claims here about the eventual possibility of machine translation of general texts. I am simply pointing out that with **CURRENT TECHNIQUES**, there is a sharp distinction in the level of success in processing general-language texts vs. domain-specific texts.

C. 2. Speech Processing

Computer processing of speech has seen much progress in the past thirty years. It is now relatively straightforward to build special-

purpose hardware that can recognize a few hundred words when spoken in isolation by the same person who supplied the 'training' input. But no one has been able to build a large-scale system capable of recognizing continuous speech consisting of general vocabulary which can adapt to a new speaker in a few seconds, the way a human can. Again, there is no claim here that highly accurate speaker-independent continuous speech recognition is impossible, just that it is an entirely different problem from speaker-dependent isolated-word speech recognition within a particular domain. It would be interesting to explore why the two types of speech recognition are so different.

C. 3. Microworlds

In AI, there is a well-known distinction between large-scale, general-purpose systems and systems which operate only on a particular 'microworld'. A microworld is closely related to an extremely narrow domain. Some well-known microworlds are task-oriented. For example, there is the microworld of 'replacing a washer in a standard kitchen faucet'. A fruitful microworld in the classic AI literature is the 'restaurant' microworld, in which all that is of interest is the process of ordering a meal, receiving it, and paying for it. One of the first microworlds was the world of 'SHRDLU', a robot arm at MIT that 'lived' in a microworld consisting of several blocks of various shapes and colors on a flat surface, all within reach of the arm. A human at the keyboard could tell the arm (in plain English) to put a square block on a pointed block and get answers like 'I can't do that—it would fall off'.

This microworld is of particular interest because of the human story that goes with it. Terry Winograd, the well-known AI researcher who programmed SHRDLU, encountered the same frustration as many other AI researchers when he tried to extend the technology beyond the microworld level (Winograd, 1987, p. 109). It seemed to become a different kind of problem, not just a bigger one.

Eventually, during the 1980s, Winograd's view of language changed radically, as did mine. He left the field of AI and has explored the ideas of Heidegger and other post-modern philosophers as they apply to NLP, challenging the objectivist (he calls them 'rationalist') ideas of AI.

C. 4. Word Processing and Indexing

Over the past thirty years, what types of computer software that deal with language in any way have been the most successful? Clearly, it has been word processing software and indexing software.

Word processing software has practically destroyed the market for the classic typewriter, manual or electric. Why? Because a human writer and a computer word processor make such a good team. With word processing software, the human can easily do what a human cannot do with a classic typewriter: correct mistakes, move text, and reformat without retyping the words of the text that do not change in the process.

Indexing software takes many forms. One particularly impressive form is the kind of database search that can be done at many libraries. Hundreds of periodicals are indexed by key words, such as names of individuals. Note that this indexing is done by computer, not by hundreds of clerics laboriously creating an index of all the words used in a publication and then merging many indexes. This automatic indexing allows a human to ask for all the articles that have appeared since 1985 that mention Marvin Minsky. They can be retrieved in seconds. A highly intelligent human placed in front of a stack of periodicals would take days, months, or even years to perform the same task, if indeed the task were accomplished before insanity or at least carelessness set in.

Now at first glance, it would appear that these applications of computers (word processing and indexing) apply to general language, unlike current techniques in machine translation. However, a second glance reveals that they actually apply only to an extraordinarily narrow domain, the domain of characters (i.e. letters), font attributes, punctuation and format codes. Note that you cannot ask your word processor to delete all words that suggest sadness. But you can ask it to change all occurrences of *disk* to *diskette*. This will be fine unless you only want it to change occurrences of *disk* that refer to computer disks and leave untouched those occurrences that refer to a 'disk in the spine'. In the domain of word processing, the software does not really process words at all, **BUT RATHER SEQUENCES OF CHARACTERS** surrounded by punctuation or spaces. Likewise, standard techniques of indexing do not deal with content but with **THE STRINGS OF CHARACTERS**. Sometimes a thesaurus is used to find an article that deals with a certain topic, but here the thesaurus is used to suggest additional words to search for, based on associations that some human has encoded in the thesaurus. Indexing software does not actually deal with the meaning of words any

more than does word processing, but it does something that a human cannot do. It quickly finds specific sequences of letters surrounded by punctuation in a large corpus of text. In effect, the success of word processing and indexing comes FROM LIMITING THE COMPUTER TASK TO A WELL-DEFINED, EXTREMELY NARROW DOMAIN¹¹.

C. 5. User Interfaces

Another area of language contact between humans and computers is the user interface for software. Over the past thirty years, two very different attempts have been made to replace the traditional command-line interface of Unix, DOS, VM/CMS and other operating systems with a more intuitive interface. One attempt is succeeding dramatically, while the other has yet to become a serious commercial reality.

The one which is succeeding is called a GUI (Graphical User Interface). It began with the STAR(tm) system, which was developed at Xerox Corporation's Palo Alto research center. The user interface from the STAR was seen by Steve Jobs of Apple Computer and a similar interface was used for the Macintosh(tm) computer. Apple and Microsoft made an arrangement for a similar interface to be used in Windows(tm). This means that soon the majority of all personal computers may present a similar interface to the user.¹²

The one which has not seen nearly so much success is the natural language interface, in which the user communicates with the computer in unrestricted natural language. There are cases when the user types commands to a computer program in English. But there are several problems that have not been overcome. Sometimes the structure of a particular domain is built into the computer system. An example of a built-in domain is 'adventure' games where all commands must apply to the 'microworld' of the game, but when there is no well-defined universe of discourse, the human has difficulty restricting commands to what the computer can process accurately. The GUI is actually a very narrow domain in which all that exists is the icons and menus and the mouse and various 'clicks'. The user shifts into domain-specific mode and temporarily lives in the GUI domain. When there is no well-defined domain and the user is invited to type commands in English (or Hungarian or any other natural language), the commands may become dynamic general language and then the human-computer interface fails to function effectively. A few years ago, the Japanese 5th Generation Computer project included as a major goal the development of a universal natural language user interface. That goal was quietly

dropped, confirming the substantial difference between general and domain networks.

IV. A SUMMARY OF THE PAPER SO FAR

We began by noting my deep involvement in a machine translation project in the 1970s. Using human-computer interaction, the system succeeded in producing syntactic analyses of sentences of general text. However, the system failed to produce acceptable words in the output. During the 1980s, I worked on tools for human translators, as opposed to machine translation, and was struck with the insight that there is a much greater difference between words of general vocabulary and domain-specific terms than I had previously suspected. This distinction, if valid, could explain why our project failed to produce acceptable output despite syntactic success, while some other machine-translation projects did produce acceptable output. The explanation is that we attempted to translate general-language texts, while successful projects focussed on highly restricted domain-specific texts. Techniques which work on domain-specific texts do not apply to general-language texts because the semantic network associated with general language is dynamic while the semantic network associated with a narrow domain is intentionally frozen. I have given evidence for the general/domain distinction from sample texts, from cross-language studies of asymmetry, and from the history of natural language processing.

We have now reached a turning point in this paper. We hope the reader is now convinced that the general/domain distinction is fundamental or is at least willing to use the distinction as a working hypothesis.

The rest of the paper will build on the general/domain distinction. We will look at possible implications for the status of Chomskyan linguistics and explore some philosophical issues that have been unresolved for a long time, issues that bear on the distinction and explain it. In the course of our explanations we will see not only that it is futile to look for the universal set of sememes, but that there are better questions to explore, such as how we can explain the **GROUNDING OF GENERAL LANGUAGE WITHOUT ARTIFICIALLY ELIMINATING AMBIGUITY** (which would transform general language into a domain language). To 'ground' language is to provide a basis outside of language for meaning in language.

V. CHOMSKYAN LINGUISTICS AND THE GENERAL/DOMAIN DISTINCTION

Could the general/domain distinction outlined above have something of importance to say about Chomskyan¹³ linguistics? In later sections we will look at what Chomsky and several others have to say about the philosophy of language, but for now we will look at Chomskyan linguistics from the practical point of view of what generative grammarians do, especially those who consider themselves to be in the Chomsky camp.

AN OBVIOUS QUESTION TO ASK IS WHETHER GENERATIVE GRAMMARIANS STUDY GENERAL LANGUAGE OR DOMAIN-SPECIFIC LANGUAGE. An easy answer is that generative grammarians must be studying general language because they do not take their sample sentences from any one technical domain, such as horticulture or accounting.

However, we should perhaps not be so hasty. A domain-specific network is not necessarily high-tech or from the sciences. The language used to command Winograd's block-world robot was not technical but it was certainly domain-specific. There are two aspects of generative grammar (GG) that suggest it is dealing with a domain: the restriction to sentences in isolation and the principle of autonomous syntax. Let us consider their significance to the general/domain question. After presenting our case that GG deals with a domain, we will explore how ambiguity relates to the general/domain distinction.

From the early theory in *Syntactic Structures*, to the standard theory in *Aspects*, to the Extended Standard Theory, to Government and Binding, to Principles and Parameters, generative grammar has never wavered in its insistence that sentences should only be dealt with in isolation. A sentence is presented for evaluation by the native speaker, and the only responses allowed are 'acceptable', with no asterisk, and 'unacceptable', with an asterisk. Sometimes a question mark is allowed, but it is considered bad form. The point is that an asterisk can never be dependent on a special context in which the sentence might be acceptable. For example, a standard GG textbook (Radford, p. 134) gives the following sentence in a discussion of particles:

- (1) *The handle might come suddenly.

The text of the discussion shows that the point of the example is that particles (such as 'off') and adverbs (such as 'suddenly') are not equivalent. Certainly, sentence (1) is not parallel to sentence (2).

(2) The handle might come off.

However, a sentence in isolation should not be sensitive to the purpose of the example. So, here is a possible context for sentence (1). You are in a factory, assembling suitcases from parts that appear on a conveyer belt. Your trainer points out that although the big parts have sufficient space between them on the belt for you to react, the handle might come suddenly, and you will not have enough time to attach it and be ready for the next part unless you are alert and efficient.¹⁴

Anyone who has taught generative grammar has been bombarded repeatedly by questions from students who disagree with one asterisk or another on example sentences in the textbook. **THE INSTRUCTOR MUST EXPLAIN THAT GENERATIVE GRAMMAR DOES NOT DEAL WITH ANY UNUSUAL READINGS. IT DEALS ONLY WITH THE READING THAT THE SENTENCE IS TAKEN TO HAVE IN ISOLATION, WITHOUT ANY PARTICULAR CONTEXT.**¹⁵

The requirement of treating sentences in isolation points strongly toward domain-specific text rather than general text. A brief discussion will explain why. In an interesting novel (as opposed to pulp fiction which could probably be computer-generated with current technology using minor variations on fixed plots), a sentence at the end of a chapter may require details from the beginning of the chapter or even previous chapters in order to be understood. **CONTEXTUAL DEPENDENCE IS A HALLMARK OF GENERAL LANGUAGE.** There is no piece of information on any topic that can be ruled out in advance as irrelevant to the interpretation of a general-language text, until after the text has been read. An editorial about Central Europe may assume an understanding of how clothes were washed before electric washers became available. Before reading a piece of general text, the potentially relevant information is essentially unrestricted. It is only after the reader has interpreted the piece that the relevant bits of information can be identified.

In contrast, the desirability of sentences being understandable in isolation **IS A HALLMARK OF DOMAIN-SPECIFIC TEXT.** An instruction manual which tells a technician how to repair a machine would not be highly prized if a crucial sentence could only be understood in the context of an extended metaphor developed in previous chapters. What **WOULD** be highly prized would be a manual in which one could turn to any section and follow the instructions without remembering what came before. Obvious exceptions would be that one should not enter a step-by-step sequence in the middle, but it would still be desirable to be able to interrupt a step-by-step process, leaving the machine in a state that corresponds to instruction 175, and pick up with instruction 176 after lunch.

So generative grammar's restriction to readings in isolation suggests that it treats only domain specific text. This may seem strange at this point.

What is left unsaid is that sentences of a domain-specific text are not actually acontextual. Rather, they all have the same context, and that context is the domain itself. A 'clean' domain consists of a finite number of fixed core concepts which are tied together into a coherent network of relationships. Once someone has learned all the concepts and their relations, information about the domain can be transmitted very efficiently. Ideally, there is exactly one term per concept. If the domain is shared across experts in several language areas, there may be just one term per language. The goal in a domain network is to allow sentences to be constructed so that they will be understood the same by anyone who is familiar with the domain.

Suppose that generative grammar examples are actually taken from a 'domain', even though they look like sentences of general language. What could that domain be? One day, while reflecting on the general/domain distinction, I suddenly realized that generative grammar, in adhering to the principles of isolated sentences and autonomous syntax, has selected the 'domain of the utterly boring world'!

The vast majority of all English sentences are actually excluded from consideration in generative grammar. First we eliminate most sentences which pertain to any technical domain. They are not part of the Utterly Boring World (UBW). Then we eliminate all sentences that require any unusual context to be understood; this disqualifies much literature (perhaps all real literature).

A moment's reflection on the sentences used in textbooks and research articles dealing with generative grammar reveals that the sentences are often a fairly predictable and uninteresting lot. That is not due to a lack of imagination on the part of the linguist who creates them but due to the limitations of the Chomskyan approach.¹⁶

Even though, in this paper, we call the sentences treated by generative grammar a domain, it is clearly different from a standard technical domain. There is no coherent, well-defined subject matter under consideration, as in a technical domain. The domain is instead defined by what generative grammar can handle, namely, sentences that can be understood as a syntactic combination of words that have typical meanings. The reason we throw the example sentences of generative grammar in with domain languages rather than with general language is that, like domain languages, generative grammar allows sentences to be

understood without knowing which sentences come before or after. Again, this does not show that generative grammar sentences are acontextual; rather, **THEY ARE LIMITED TO A UNIFORMLY BORING CONTEXT IN WHICH NOTHING TRULY SURPRISING HAPPENS.** The utterly boring world of generative grammar may be likened to a 'soap opera' world in which there are **ENDLESS, PREDICTABLE VARIATIONS ON WHO WILL MARRY WHOM, WHO WILL DIVORCE WHOM, AND WHO WILL CHEAT ON WHOM**¹⁷.

Further reflection on generative grammar as practiced and taught will reveal that there is something missing in generative grammar texts. Even though there is great emphasis on universals, the term UG (Universal Grammar) often being used to describe the model to highlight the claim that it applies to all languages, and even though there are often examples of syntactic constraints or alpha-movement given in several languages, I have never seen a section on translation (Makkai, 1993, p. 15). I suspect that including such a section would raise uncomfortable questions, such as why there is never any mention of the meanings of words other than grammatically-based distinctions. Words in the examples in generative grammar texts are assumed to have their 'typical' meaning. The limiting effect of this assumption would be highlighted by any attempt to apply UG to the translation of general-language text.

If indeed a restriction to a treatment of sentences in isolation implies boredom and limitations, why does generative grammar retain this restriction? Probably because of the principle of autonomous syntax, mentioned at the beginning of this section as the other domain-oriented aspect of generative grammar. Autonomous syntax does not mean syntax unrelated to semantics. Instead, it defines the relation between syntax and semantics. According to autonomous syntax, semantics is interpretive, based on syntax. Thus the meaning of a sentence should be derivable from the syntactic structure of a sentence and from the lexicon. However, the syntactic component must be self-contained, which means that the semantic interpretation module can be removed without disturbing the syntactic module. This implies that the syntactic well-formedness of a sentence cannot depend on its meaning, since its meaning is not available except as an 'afterthought' to its syntactic representation. No syntactic rule can refer to semantics, even though semantics can and should refer to syntax.¹⁸

It is clear that the autonomous syntax principle implies the need to treat sentences in isolation. If even one meaning-based contextual factor were significant in the decision of whether a sentence should have an asterisk, then that contextual factor would have to be referred to in a syntactic well-formedness rule. Then the syntax component

would no longer be autonomous. It would depend on factors outside the Utterly Boring World.¹⁹ And once a single sentence-external factor from dynamic general language is allowed to influence the assignment or removal of an asterisk, there is no principled basis on which to deny any other factor. The floodgates would open, the single determinative context of the domain would have been eliminated, and sentences could no longer be treated in isolation.

Why has Chomsky been insistent on keeping the principles of autonomous syntax and isolated sentences for so long while many other aspects of his model of language have changed dramatically? Probably because the mixing of syntax and semantics would mean that his model of language (currently called the I-language for 'internal' language) would no longer be a self-contained machine which can generate the sentences of a language (currently called the E-language for 'external' language) mechanically, without the presence of a human. Once we leave the Utterly Boring World, there is, as previously discussed, no limit which can be imposed in advance on what might be relevant to the processing of a sentence.

I am not attempting here to say that Chomsky should or should not drop his insistence on autonomous syntax and the restriction that only sentences in isolation are acceptable objects of study. I am simply suggesting that the principles of autonomous syntax and isolated sentences imply that generative grammar, including all of Chomsky's versions and all other branches of generative grammar that share these two principles, is actually dealing with a non-technical domain-specific language rather than with general language. As we have already pointed out, this domain language of the Utterly Boring World is different from other domain languages in one respect—the language does not relate to a predefined task or area of knowledge; it grows as needed to define the set of isolated sentences to which generative grammar applies.

At this point we hope the reader is at least willing to explore some consequences of the hypothesis that GG deals with a type of domain rather than with dynamic general language. We will now look at some consequences for ambiguity.

How does ambiguity bear on the overall framework of generative grammar and the Utterly Boring World? We have discussed ambiguity throughout this paper and have implied that some types of ambiguity may be more fundamental than others. We distinguish two types of ambiguity, superficial and fundamental.

Superficial ambiguity, be it a distinction between broad grammatical categories in homographs or more refined cases of polysemy within a category, is the association of one symbol with two or more concepts (sometimes called categories, but not to be confused with grammatical categories), such as the symbol 'mouse', which is associated with both a rodent and its metaphorical electronic cousin. In superficial ambiguity, one can make a finite (usually very short) list of word senses, each representing a **WELL-DEFINED** meaning. Thus, a superficially ambiguous symbol can be considered to be the name of a mathematical set of two or more well-defined concepts, and an unambiguous symbol would obviously be the name of a set consisting of just one concept.

Fundamental ambiguity is the association of one symbol with a dynamically extensible set of concepts and involves the formation of fundamentally new concepts, not just mechanical combinations of existing concepts. Looking back at my experience in translation, I have observed that new concepts can be generated dynamically by viewing a situation in a novel way, often with the help of metaphor. In a system **WITHOUT** fundamental ambiguity, there could only be one correct basis for viewing the world. Meaning would somehow be 'available'. Since superficial ambiguity could be eliminated using homograph numbers, we could speak of language in such a world as being, in a sense, 'unambiguous', that is, lacking in fundamental ambiguity. If however, there is no determinate list of word senses, we do have fundamental ambiguity. Potentially, one person's view of the world could be different and incompatible from that of another person, and there is not one basic set of concepts that corresponds to reality to the exclusion of all others. Even if there is one view of the world that is in some sense the best one, we do not need access to that view in order to learn a language, distinguish between true and false statements in that language, nor engage in meaningful dialog with others.

Which type of ambiguity is treated in generative grammar? Chomsky himself has not written much about the semantic interpretation component, choosing to focus on the syntactic component. However, he has collaborated with colleagues who have written on semantics in generative grammar. Although details differ, there is a crucial assumption behind all discussions of the semantic component: meaning is assumed to be derived by bottom-up composition. That is, a syntactic representation of a sentence is processed from the bottom nodes (to which the words—called lexical items—are attached) up to the top of the syntactic tree. Each word attached to a terminal node displays only superficial ambiguity, since each semantic interpretation involves choosing one of the concepts associated with each symbol and

combining the basic concepts into a 'complex concept' which represents one meaning of the sentence. These basic concepts are stored in the lexicon as word senses. It is extremely important to note that the semantic interpretation component also treats sentences in isolation, as does the syntactic component. Thus the syntactic component treats the symbols (LTUs) and their syntactic relations, while the semantic component treats the concepts associated with the symbols and combines them into 'semantic structures'. Each semantic structure is assumed to be unambiguous, since it consists of well-defined concepts combined in well-defined ways. Only in the pragmatic component, in which context and situation are finally allowed to be considered, is one of the semantic structures selected as the correct meaning of a sentence in context. But it is far too late at that point, given the framework just described, to introduce any fundamental ambiguity.

Thus, generative grammar uses superficial ambiguity to fulfill its overall purpose of defining a mathematical device (the total grammar, including the syntactic and semantic components) which associates each surface sentence (a simple sequence of characters) with one or more syntactic structures and associates each syntactic structure with one or more semantic structures. In other words, a generative grammar defines the relationship between sound (surface sentences) and meaning (semantic structures). Defining the relationship between sound and meaning, which Chomsky would say constitutes knowledge of language, is a classic goal of linguistic theory. Another is explaining how we acquire this knowledge. In Chomskyan linguistics, the actual use of language to communicate is considered separate from knowledge and acquisition (Chomsky, 1986, p. 3).

I claim that Chomskyan linguistics does not allow for fundamental ambiguity. Fundamental ambiguity would be inimical to the principles of autonomous syntax and isolated sentences, since it would make it impossible to store in the lexicon, in advance, all the information necessary for computing all possible meanings of a sentence. All possible views of the world and all possible situations with all their associated discrete concepts would have to be stored in the lexicon. This is precisely what my experience in machine translation demonstrates to be impossible for general language. But Chomsky is not at all alone in assuming, although perhaps not consciously, that all ambiguity is superficial. He is simply working within a very well-received framework which has been pursued for hundreds of years. This framework is part of what, in the next section, we will call 'objectivism'. It assumes that all meaning can be built up by a process of composition from a pre-defined list of basic concepts. Mathematics is a prime example of the bottom-up methodology. (It is not irrelevant

that when I began working in machine translation, I was finishing a degree in mathematics.) A formal mathematical proof is based on an explicit list of undefined basic terms (unambiguous symbols) such as *point*, *line*, or *set*, axioms, and rules of logic. From this self-contained system, any mathematician anywhere in the world, regardless of situation, can verify the proof.

My experience in machine translation tells me that language does not always behave so nicely. So we perhaps now have a basis for an explanation of the nature of the difference between dynamic general language and a very narrow and well-defined domain-specific language. Such domain-specific language is a special, highly limited case of general language which **CAN BE TREATED AS IF THERE WERE NO FUNDAMENTAL AMBIGUITY!**²⁰ In other words, it is a highly limited kind of language which can be treated as if it were something that language, in general, is not. That would explain why there is a continual back-and-forth play between general language and technical terms, yet also explain why techniques that apply to domain-specific language cannot necessarily be extended to general language. General language violates the assumptions about compositional superficial ambiguity on which the techniques are based.

Another perspective on the general/domain distinction is to propose a distinction between a closed infinity and an open infinity. A closed infinity would be something like the infinite set of positive integers (1, 2, 3, 4, 5, and so on). It is closed because there are no surprises. It is completely predictable. Give me any integer, even one that I have never seen before, and I can immediately generate it mechanically as a completely predictable member of the closed infinity of integers. **THE 'CREATIVITY' OF GENERATIVE GRAMMAR IS A CLOSED INFINITY, SINCE IT IS BASED ENTIRELY ON THE MATHEMATICAL OPERATION OF RECURSION.** The set of phrase markers generated by recursive embedding is entirely predictable. An open infinity is one in which there **ARE** surprises. An example would be the infinity of plots that can be found in a novel. From the point of view of a novel as a sequence of characters (characters such as the letters A, B, C rather than people), one can predict all possible novels mechanically by permuting all possible sequences of characters. But this falls far short of the mark, since the vast majority of the sequences would not be a valid text at all. We all know that sometimes a novel is a truly creative work of literary art and sometimes it is a boring copy of a well-known plot. The next truly creative novel will be recognized as adding a member to an open infinity of plots, but we cannot, before the writing of that novel, predict, in any meaningful way, exactly what it will be like. Of course, domains are not completely static, but they draw on general language principles

for changes in their inventory of terms and then are treated as static until they break down, whereas general language should not be static and is not considered 'broken' in the case of dynamic metaphor.

A DOMAIN LANGUAGE IMPLIES A CLOSED INFINITY OF TEXTS, WHILE GENERAL LANGUAGE IMPLIES AN OPEN INFINITY OF TEXTS. Chomsky puts himself in the closed infinity camp when he says that 'the language faculty is a computational system that is rich and narrowly constrained in structure and rigid in its essential operations' (1986, p. 43). Yet, he acknowledges that there is more to language than rigid cause and effect. Later in the book *Knowledge of Language*, he writes, 'we cannot predict what people will say. Our behaviour is not "caused" by our knowledge, or by the rules and principles that constitute it. In fact, we do not know how our behaviour is caused, or whether it is proper to think of it as caused at all, but that is another matter entirely' (1986, p. 260). Perhaps the general/domain distinction can be helpful in resolving the tension stemming from an attempt to decide whether language is a closed or open infinity. For some purposes, such as technical communication within a domain, it is useful for language to be more closed. But we would not want general language to be closed. It is unproductive to try to decide whether all of language is one way or the other, and it is unrealistic to expect a 'narrowly constrained' and 'rigid' system to explain general language.

At this point, I can come through on the first promise in the foreword. I said we would find that machine translation and Chomskyan linguistics share assumptions about the nature of language that limit both of them. The major assumption they share is that they both assume that all language acts like domain-specific language. In practice this means that they both use techniques which limit their application to domain-specific text. It is far from clear that this limitation would be easy to repair. Indeed, the arguments I have given from considerations drawn from translation theory and practice, together with observations about what generative grammarians do, indicate that it is highly doubtful that their current techniques can be extended to apply to dynamic general language. Entirely new techniques may be needed, and with them entirely new assumptions, so thoroughly different from current ones as to render their current shape and their future shape to appear nearly unrelated. These startling claims are based on observation of language from the point of view of one who has worked intensively with translation, both human and machine. The basis for these claims is translation, but their implications are much broader.

If the hypothesis developed so far in this paper is correct, that is, if generative grammar describes the UBW domain (Utterly Boring World

domain) rather than describing dynamic general language, and if one is interested in dynamic general language, then an alternative approach to language is needed. Autonomous syntax and isolated sentences are so fundamental to generative grammar that it is difficult to imagine how generative grammar would look without these principles, so we will look outside generative grammar to work by Lakoff and, later in the paper, by Levinas.²¹ If Chomsky feels that there is no need to look outside of GG and its basic assumptions for an adequate account of dynamic general language and that general language is fully computable, then the burden of proof is on Chomsky to explain how to design a machine translation system so that it provides fully-automatic high-quality translation of general text (sometimes called FAHQT).

George Lakoff, who came from within generative grammar as a proponent of Generative Semantics, challenged the autonomous syntax and isolated sentence principles long ago. We will look at his recent work in cognitive linguistics as an approach to language that may deal with dynamic general language, though not yet a fully computable one. This will in turn lead us into a consideration of the nature of categories (that is, conceptual categories, or concepts), how they are grounded (that is, what they are based on) and whether they exhibit fundamental ambiguity.

VI. LAKOFF ON THE NATURE OF LANGUAGE

In his book *Women, Fire, and Dangerous Things* (1987), Lakoff describes two contrasting approaches to language: objectivism and experientialism. Objectivism is the name Lakoff gives to a traditional view with ancient roots. In its modern form, objectivism (sometimes called rationalism, although rationalism does not often equate with objectivism) assumes that 'rational thought consists in the manipulation of abstract symbols and that these symbols get their meaning via a correspondence with the world, objectively construed, that is, independent of any organism' (Lakoff, 1987, p. xii). The 'organism' referred to is the human organism. The abstract symbols may be sequences of characters (which are often called words).

Lakoff then lists more specific aspects of the objectivist view (pp. xii-xiii and throughout the book), including the following:

- Thought is the mechanical manipulation of abstract symbols.
- The mind is an abstract machine, manipulating symbols in the way a computer does.

- Symbols get their meaning via correspondences to things in the real world. There is only one correct correspondence, the one that corresponds to the structure of the real world. Superficial ambiguity of symbols is allowed, but no fundamental ambiguity, since there is one definitive set of things that symbols can correspond to.
- Thought is abstract and does not require a human body (a computer will do as well). It is independent of any limitations of the human body, the human perceptual system, and the human nervous system.
- Machines that do no more than mechanically manipulate symbols that correspond to things in the world are capable of meaningful thought and reason.
- Thought is atomistic, in that it can be completely broken down into simple 'building blocks' which are combined into complexes and manipulated by rules.
- Thought is logical in the narrow technical sense used by philosophical logicians; that is, it can be modeled accurately by systems of the sort used in mathematical logic.

Lakoff points out that not all of these assumptions are held by every objectivist, but most hold many of them.

Central to such views is the notion of category. On the objectivist view, a category is a mathematical set, and a thing is either a full-fledged member of the category or not a member at all. Things are in the same category if and only if they have certain properties in common. All conceptual categories must be symbols or symbolic structures which can designate categories in the real world, or in some possible world. And the world must come already divided up into nice, clean categories whose members all share certain properties.

Lakoff's alternative to objectivism he calls experientialism (pp. xvi-xvii and throughout the book). On the experiential view, thought is embodied. Meaningful thought and reason are directly tied to the nature of the organism doing the thinking, including the nature of its body, its interaction with its environment, and its social character.

- Thought is not just a mechanical manipulation of abstract symbols. It uses cognitive models that are meaningful.

- Our mind does not manipulate symbols the same way a computer does. General cognitive mechanisms for recognizing similarity of mental images and using metaphor are essential to language.
- Thought is imaginative and goes beyond correspondence to things in the real world. There is not just one correct view of the world.
- Thought is embodied. It is influenced by the nature of the human body.
- Thought is more than mechanical manipulation of symbols. For example, it has *gestalt* properties.
- Thought is not atomistic. We can start 'in the middle' and become more specific or more general.
- Mathematical logic is insufficient to model human thought.

Lakoff's view of categories is much richer than categories as mathematical sets. He reviews a large body of experimental research on human conceptual categories. It is well established that they display prototype effects; that is, some members of the category are privileged as better members of the category than others. Lakoff calls human categories 'cognitive models'. Some are scalar (such as 'tall man' on a scale of inches). Some are metonymic and metaphorical. Some are radial, that is, they involve several models around a center. The non-central models are motivated by the center but not entirely predictable. Each of these types of category accounts for some prototype effects. In classical categories, all members have an equal status; therefore, prototype effects are not adequately accounted for.

Lakoff argues convincingly that metaphor is not a 'sideline' of language but rather a pervasive aspect, which goes a long way toward explaining dynamic creation of meanings in general language.

The reader is encouraged to refer to Lakoff's 1987 book for a much more detailed explanation of arguments against objectivism and for experientialism (which is the basis for Lakoff's cognitive linguistics) and for an interesting account of metaphor, in which dynamic meaning is unpredictable yet motivated.

VII. LAKOFF AND CHOMSKY

The connection between Lakoff's work and the general/domain distinction is fairly obvious. Experientialism seems to be concerned with dynamic general language rather than domain-specific language. In a later book, Lakoff and Turner (1989) apply their approach to the analysis of poetry, especially poetic metaphor. There is no attempt to require that sentences be treated in isolation, and there is no attempt to keep syntax autonomous, since these two principles are not consistent with the experiential view. **GENERATIVE GRAMMAR AND MACHINE TRANSLATION BOTH SHY AWAY FROM POETRY.** Some would say it is outside their **DOMAIN.**

From the point of view of generative grammar, Lakoff has given up too much to be able to analyze poetry. He has given up computability. Granted, it is not currently possible to program a computer to produce the kind of analysis that Lakoff and Turner propose.²² However, we should not reject the possibility. At least the approach is not self-limiting.

I do have a minor addendum to what Lakoff says. In the intensity of his effort to discredit objectivism, he seems to have overlooked the following possibility: objectivism, with a 'tiny' adjustment, may be an appropriate framework for analyzing domain-specific text. As mentioned before, a domain language may be a restricted form of language which can be treated like something that it is not. The proposed 'adjustment' is to define the 'real world' as any internally-consistent domain created by human intelligence using general language.

In other words, general language provides the metalanguage and the 'metaphysics' of domain languages, and objectivism can provide a model for treating domain language. In a domain language, it is desirable to define the concepts so that the meaning of a sentence can be obtained through a bottom-up combination of its terminological units. Any exceptions are simply removed from the domain language until the domain language is 'clean'. We do not have this luxury when working with general language in context. For the purposes of information retrieval, it is very useful to require that any mention of a concept use a consistent technical term. Dynamic metaphor is not allowed, even though many of the technical terms were first created using metaphor then standardized or 'frozen'. The standard paradigm for machine translation (analysis, transfer, and synthesis) can apply because the language is adjusted artificially until it does apply.

It would be problematical to be forced to choose between Chomsky and Lakoff. Chomsky's approach applies only to domain-

specific languages and may not be extendable to general language. Lakoff's approach seems to apply to general language, but may be more powerful than needed for working with domain-specific language. Such a dual-method approach is not uncommon. In engineering, one can usually use Newtonian physics and ignore relativistic effects. However, if one were designing a spacecraft that was to travel at ninety-nine percent of the speed of light, one could no longer ignore Einsteinian physics. If one is designing a normal light bulb, Ohm's law may be sufficient, but when one gets down to beams of light which consist of small numbers of photons, quantum mechanics must be taken into account. Yet one does not want to use the more complex relativistic or quantum mechanics if they are not needed. These examples are perhaps not good, because domain-specific language is an extreme case which permits less complex tools rather than more complex ones. A better example might be the computation of the speed at which an object falls. If one can restrict the situation to eliminate friction by creating a vacuum, then the computations are greatly simplified. Likewise, restricting language to eliminate fundamental ambiguity greatly simplifies computation.

Now we are in a position to comment further on why it is not realistic to try to create a list of universal sememes and to map words of general vocabulary onto and out of them. Although there is every reason to believe that the universal sememe approach can be used within a domain of knowledge shared by speakers of various languages (one simply adjusts the concepts until it works), there is no reason to assume that it is possible to list all the meanings of a lexical unit representing a general language category, since new ones can be created as desired. And there is no reason to assume that each language has the same general semantic network as every other language—that is, unless we all have the same innate ideas. This possibility raises the question of what are the positions of Chomsky and Lakoff on the origin of our concepts.

Chomsky's position on the acquisition of syntax is well-known. He claims that there is an innate language faculty in which 'switches' are set based on meager linguistic data. The faculty then becomes the core syntactic component of one language or another.

He has written less that discloses his position on the acquisition of concepts. However, he does state that a generative grammar of a particular language is 'a theory that is concerned with the form and meaning of expressions of this language' (1986, p. 3). He has claimed repeatedly that language acquisition depends on an innate 'language faculty'. Since he does NOT qualify language acquisition to be solely the

acquisition of syntax, even though in practice he deals primarily with syntactic rules, we will assume that the possible concepts, as well as the possible syntactic rules, are, for Chomsky, somehow determined by the language faculty. What is more important is that they are devoid of fundamental ambiguity. This is consistent with a 1991 interview (Horning, 1991) in which Chomsky talks about the concept *climb* and says, 'Every child learns it perfectly right away. Now that can only mean one thing. Namely, human nature gives us the concept *climb* for free.' The interviewer notes that he goes on to submit that the same is probably true for 'most concepts embodied in words'. Chomsky clarifies his disbelief in fundamental ambiguity when he states, 'This is the way we learn language. We simply learn the label that goes with the preexisting concept.' Strictly speaking, the claim we are making in this paper—that there is fundamental ambiguity—is not incompatible with the idea of an innate cognitive capacity. It is only incompatible with the idea that all concepts for all people are built from one universal set of primitive concepts.

Lakoff's position on the acquisition of concepts is that they are not directly determined by the nature of reality. Rather, they are tied to the nature of our physical bodies, our interaction with the environment, and our social character. He seems to imply that there is not just one set of possible concepts (Lakoff, 1987, p. 261).

As I have discussed above, the origin of domain-specific concepts has been resolved. They originate within general language by the dynamic process of creating new LTUs. These LTUs become stable and form terms which can be processed in a straightforward way within a domain, using a well-developed tradition of bottom-up composition, because that is the intent of their creation.

I have suggested that a well-defined, coherent domain-specific language can be usefully treated according to the methods of objectivism, but that language in general requires a more dynamic approach, perhaps along the lines of experientialism. What is not yet resolved is how we acquire the categories of our general-language network which allow us to communicate and to create domain-specific networks. In the next section we will look at some philosophical traditions that bear on the question of the relation between our concepts and the real world.

VIII. SOME TRADITIONS IN WESTERN PHILOSOPHY AND LINGUISTICS

In previous sections, we²³ have claimed that, in practice, Chomskyan linguistics makes two assumptions about the nature of language which are tightly connected and highly questionable:

- (a) There is no fundamental ambiguity; that is, there is only one set of primitive concepts, and they are 'given' to us. In shorthand style, we could express this assumption by saying that language is 'unambiguous' [to the speaker].
- (b) Meaning is generated from the bottom up by combining primitive or atomistic concepts or terms into more complex concepts or terms in accordance with certain rules.

The existence of atomistic concepts would deny fundamental ambiguity. We have already concluded from experience in machine translation that there is fundamental ambiguity. And thus we have already rejected (a) and (b). Nevertheless, in this section we will reexamine these assumptions within some traditions of Western philosophy and linguistics, including views on the origin of atomistic concepts. This will lead us to the issue of grounding vs. arbitrariness.

A. The Tradition of Bottom-up Processing from Primitives

Assumption (b) has a long tradition. Its proponents include everyone who has taken mathematics as a model for intellectual work and for the operation of the intellect itself. This tradition includes Galileo, Descartes, Hobbes, Newton, and Hume. For some, it is only a methodology of intellectual analysis: we employ it when we want to understand and explain accurately and thoroughly. For others, it is a psychological model: we employ it always, to the extent that our representations are meaningful. Newton seems to be a clear example of the methodological branch of the tradition; Hume and Chomsky are examples of the psychological one.

Now assumption (a) delimits the range of answers we can give to the question of how it is that language can be meaningful, i.e., how it is that we can acquire empirical concepts and deploy them in our perceptual experience and in our thinking. How does it come about that reality provides us with a basis for acquiring concepts and rules that we use in forming sentences and linking sentences together in discourse in order to communicate and reason?

B. Concepts and Rules as Given

One type of answer to questions about the nature and acquisition of both concepts and rules is that they are 'given'. This means that they are somehow provided to us or instilled in us independently of our use of language.

In this paper we want to restrict ourselves to discussing the acquisition and application of **CONCEPTS**, and treating the acquisition and application of **RULES** only lightly.

One idea of the way that concepts might be 'given' is this: they are acquired in the first place by direct experience with things in the world and later applied in the same way. That is, we pick up from our caretakers' daily talk a stock of words, and by attending to the situations in which they use those words, we discover what objects, properties, or circumstances the words apply to. On this view, a concept is merely a correlation between a word and a directly experienced thing. And when we master the connection, that is, the hook-up, when we get the relevant concepts, we can thereafter use the words accurately ourselves.

Is anything wrong with this common-sense picture? Yes, and it has frequently been pointed out. We cannot identify things preliminary to correlating or applying concepts to them. We must have a concept already, and use it, in order to get the concept. Applying the concept acontextually, asocially, once it is obtained is, as we shall see, equally problematic. We have to use the concept in perception in order to identify the thing so that we can then apply the concept. So this account of how concepts are 'given' invokes **EITHER (A) THE NECESSITY OF ACQUIRING AND APPLYING CONCEPTS PRIOR TO ACQUIRING THEM, OR ELSE (B) THE NECESSITY OF MAKING IDENTIFICATIONS OF OBJECTS WITHOUT APPLYING CONCEPTS TO THEM.** Both these alternatives make no sense at all. For, generally speaking, **WHEN WE TRY TO CORRELATE LANGUAGE WITH THE WORLD, THE WORLD WE ENCOUNTER IS ONE WE ARE ALREADY DESCRIBING LINGUISTICALLY.** In some quarters this has been called the problem of 'the given'; in others, it is the insight that we cannot escape the circle of language.

Plato's intuitions about this problem lie behind his doctrine that we must have encountered, prior to our mortal cognitive experience, exemplars of at least the key concepts that we use in organizing our experience. Although we may not be able to decide whether Plato views our pre-mortal existence as myth or fact, we can be sure of his

belief that it is by the 'eye of the soul', a faculty of direct intellectual intuition presumably operative in that existence, that we apprehend the pure forms or the ideas of triangularity, circularity, justice, etc. in a manner that does presuppose that we have these forms in mind already. Possessing familiarity of the forms—in our modern parlance we would say, possessing the concepts—we can in this life recognize and categorize the various particular things we encounter, none of which is a perfect exemplar of the categorizing idea we employ. Plato's strategy of providing for a 'pre-provisioning' of our concepts is just one attempt to avoid the circularity in supposing that we acquire concepts and/or rules cognitively, but of course it just pushes back the problem.

Another attempt to solve the problem of the given is the doctrine of innate ideas. Many philosophers, most notably Descartes and Leibniz, believe that at least some concepts and/or rules are innate; nowadays, we say, 'built-in' or 'hardwired'. Descartes holds that at least one concept, and probably not more than one, is innate, namely, the idea of God. He believes also in a 'built-in' faculty or capacity for rationally evaluating one's own judgments or beliefs, which for the most part are arrived at through empirical experience. By means of this faculty, which he calls the 'light of nature', the individual can tell whether a proposition is necessarily true, that is, whether it cannot possibly be false.

Descartes' light of nature seems more a faculty (that works in a rule-following way) than a concept. When we review the history of philosophy, it appears that what has generally been thought of as innate ideas are either rules governing the operations of the mind or a faculty that operates according to such rules. Even Kant's 'pure categories' are not concepts or categories in the normal sense, but principles or rules, such as the principle of causality. The idea of innate concepts is a bit odd. Neither Plato nor Augustine, the great proponents of the realm of Forms, thought knowledge of the Forms is built into us rather than somehow acquired. We will return to the notion of the innate concepts, which Chomsky has espoused.

C. Chomsky and Innateness

In this particular paper we want to restrict ourselves to treating the problem of the given only insofar as it pertains to concepts. We would like to discuss this problem as it pertains to the acquisition of rules elsewhere. But we ought to say this much about this second subject: as Chomsky has insisted, the idea of such an innate faculty is in itself innocuous. Surely children possess innate capacities, and just

as surely there is some physiological realization of these capacities that supports our linguistic behavior. These claims are no more objectionable than the idea of physiological support for vision, including an eyeball and nerves that go from the retina to the brain and the idea that the brain is somehow predisposed to support sight. Our mouth, throat, and brain are certainly predisposed to support speech. But this claim of some innate capacity, which Chomsky calls innocuous, is not the issue raised by the problem of the given, and neither is it the substance of Chomsky's claim about language acquisition and competence. The issue is precisely whether this claim, which goes far beyond the innocuous thesis we've just outlined, is defensible, and this claim is that the innate faculty can generate language autonomously.

Let us survey enough of Chomsky's intellectual biography to appreciate his position on the subject of innate concepts. He worked in a broad tradition that owes much to Gottlob Frege and the 'early' Wittgenstein, the author of the *Tractatus Logico-Philosophicus*. As Gordon Baker and Peter Hacker have made abundantly clear, this tradition radically separates the sense of a sentence from its 'force' or use—that is, from all considerations of pragmatics. The effect of this tradition can easily be seen in generative grammar's autonomous syntax and interpretive semantics, which compute the possible meanings of a sentence before pragmatics (that is, context and situation) are considered. This leaves the sense of the sentence and the meaning of its component words, once they are available to a speaker, to be correlated with the world, and the supposition that this correlation can be achieved requires assuming that fundamental ambiguity can ultimately be eliminated.

Chomsky began in the 1950s with a purely mathematical approach to language in which language was defined as an unordered infinite set of 'sentences', where each 'sentence' was merely a sequence of characters that corresponded, completely devoid of context, to the characters (letters and punctuation) one would type when typing a meaningful sentence. His goal was to build an abstract finite 'machine', called a formal grammar, which would 'generate' (hence, generative grammar) exactly the infinite set of sentences of the language. Meaning was only a minor consideration at that time, or rather a hope that at some point in the future certain connections could be established between his grammar and meanings of sentences. He even hoped early on that his mathematical model would shed some insight on the mind. Later, he added an interpretive semantics component to his model and formulated ideas about language acquisition.

By the mid-1960s, Chomsky had discovered Descartes and others of the 'Cartesian' period and felt an affinity between the ideas he had developed independently and the Cartesian approach. An innate faculty seemed to him necessary for the acquisition of language; reception of the data of early-life experiences could not by itself account for our linguistic performances. Physiology provided an immediately available potential content for this formal or abstract notion of an innate language faculty, since this faculty, he plausibly suggested, may turn out to be the brain, the operations of which are structured in such a way as to be able, on the basis of the sensory experiences of infancy and childhood, to produce sentences. And computers provided a compelling if simplistic model for how the brain might do this. Discussing the way in which computers might serve as such a model can help us appreciate the plausibility, for many people, of Chomsky's approach, and also suggest the way in which this approach can deal with the problem of the given.

In computers, there is a problem called 'bootstrapping'. When you turn on the power to a computer, there is no program running. So how do you get a program started? You might say it is simply a matter of running it from the DOS prompt (or the main menu, depending on the kind of operating system you use). But there is a problem here. The operating system is a program, too, a program that runs other programs. And the operating system is not running either. You might suggest that the computer should just load the operating system from disk and run it. But here we have the same problem. We need a program even to read in the operating system from disk. So how do we get things started? Obviously, things do get started—at least they usually do unless your computer is in need of repair. But it should not be obvious at this point, unless you know a lot about computers, exactly how things get started. (By the way, the term 'bootstrapping' suggests the mystery of the operation, since it stands for 'pulling oneself up by one's bootstraps', which is a real trick.) The answer is that there is a simple program built in to your computer which runs every time you turn on the power. This program and the circuitry that runs it at 'boot' time are 'hardwired' (that is, physically built) into your computer. All this 'boot' program knows how to do is to read the information from a pre-defined spot on the disk (the 'boot sector') into main memory (RAM) and assume that it is a program. This program is then responsible for reading in the operating system and running it. The operating system in turn allows you to decide what to do next.

The problem of 'booting' (short for bootstrapping) a computer can be compared with the problem of acquiring basic linguistic categories (the basic concepts of general language). How do we acquire a new

concept? One might be inclined to answer that we acquire a new concept in terms of concepts we already have. This is certainly true for derivative concepts which can be completely defined in terms of other concepts. For example, *pyromania* can probably be explained in terms of the concepts of *arson* and *compulsive behavior*. But what if you do not know what *arson* is? Well, that can be explained in terms of setting a fire with the intent to destroy. How far can this go? Eventually, you get down to basic concepts that can only be defined in terms of other basic concepts. How many basic concepts are there that we need to understand in order to acquire a full-blown adult general language vocabulary? The *Longman Dictionary of Contemporary English* is one of the few dictionaries that takes this question very seriously. In it, all definitions are written in terms of a defining vocabulary of about two thousand words. Of course, this does not really account for an adult vocabulary, since it ignores the question of proper nouns. But most proper nouns can be defined by using some general vocabulary to focus one's attention and then by pointing at an object and associating it with the proper noun. So as a working hypothesis, let us say that we need a couple thousand basic concepts to get things started, to 'bootstrap' our acquisition of vocabulary. The obvious question then is whether these basic concepts are 'hardwired' into our brain, so that other 'inputted' material can be conceptualized. And if they are not 'hardwired', how could we acquire them?

Although we did not mention it in the description of booting, a computer has substantial built-in capacity for operating according to rules; this is called an 'instruction set'. The instruction set determines the ways in which a computer can 'think' (to use the popular metaphor). It would be better to say that the instruction set determines the low-level steps that can be used in a procedure called an algorithm, or more commonly, a computer program. Although the number of algorithms that can be implemented on a computer is infinite, it is what we have called a closed infinity. Unless the hardware malfunctions, there are no true surprises. We are sometimes surprised by what computers do, but it is usually because we are surprised at their stupidity in blindly following instructions instead of 'thinking' about what you really want them to do.

There is a long tradition, starting well before the first modern computers were built, that assumes humans are essentially machines. Roy Harris has written an intriguing book (1983) about this tradition, but we do not subscribe to this tradition and neither does Harris.

Now as we have seen already (Horning, 1991), Chomsky has said that our basic concepts must be 'hardwired'. Appreciate the plausibility

of this solution to the problem of the given. By saying that basic concepts are innate, Chomsky does not need to presume that we build them up out of experience, and thus can avoid the contradiction of supposing that we can have 'pre-linguistic' experiences out of which we formulate our concepts. We do not doubt that intuitively or explicitly, Chomsky sensed himself up against the problem of the given and could see no other way around it than to extend the doctrine of innateness from the general language faculty to include basic concepts. We have already noted, however, that those thinkers who in the tradition espoused the notion of innate ideas did not typically suppose that concepts (as opposed to rules in Descartes and Kant) were among these ideas.

At any rate, by taking this route Chomsky abandons the idea that semantic atoms derive from the basic components of the world. Words cannot be endowed with their meaning by their referents; for Chomsky, concepts—at least the basic, 'atomic' ones—pre-exist our experience of the world. Though odd to a philosopher, this doctrine has advantages. To see this, recall Chomsky's conception of a semantic network, a finite web of atomistic concepts from which complex concepts can be derived by application of rules of composition. This model precludes the possibility of fundamental ambiguity—indeed, that is part of its *raison d'être*. And it would also eliminate the possibility of grounding language in reality if the semantic atoms were not innate. For if they were not innate, they would have to be acquired through direct experience with the world, and this, as we saw in our earlier discussion of the problem of the given, cannot happen. So the way concepts are given in Chomsky—their grounding in the structure (presumably) of the brain—saves language as he conceives it from arbitrariness.

But though Chomsky achieves something by this move, he does not achieve enough. While we believe it critical to provide a grounding for language—to show why meaning is not arbitrary—we insist, for reasons we have already rehearsed from experience in machine translation, that any approach that precludes fundamental ambiguity cannot be sound. And the 'innate ideas' alternative is just as defective on THIS score as the 'direct experience' or 'word/thing correspondence' alternative. Chomsky's doctrine of innateness may proffer a solution to the problem of arbitrariness (whether you find this solution plausible is a separate question), but it does not square with facts about ambiguity disclosed in translation experience.

So we can say this another way. The plausibility of Chomsky's model when it is applied to domain-specific language disappears when it is applied to dynamic general language, just because it does not allow

for fundamental ambiguity. Let us repeat: we are not opposed to the notion of grounding; on the contrary, we think reality **MUST** somehow play a normative (that is, constraining) role in language use. What we are looking for is some approach to grounding that does not require language in its basic concepts and propositions to be limited to superficial ambiguity.

So Chomsky's self-proclaimed connection with Cartesian thought (defined in his 1966 book *Cartesian Linguistics*) places him in the objectivist camp, where he questions whether anything of significance has happened since the Cartesian period. And since then he has reaffirmed that generative grammar shares with other approaches 'the belief that certain aspects of the mind/brain can be usefully construed on the computational systems of rules that form and modify representations' (1986, p. 5). To this approach he has added a claim that concepts are innate. Chomsky's views may be internally consistent, but we have argued that they, and other variations on the Galileo-Descartes-et-al tradition of bottom-up processing from primitives, are insufficient to explain the richness of general language as we see it, with its fundamental ambiguity. Therefore, we will look at other traditions for answers to our questions about how language is possible.

D. Concepts as Arbitrary

A radical alternative approach to givenness (and one that also has a long tradition) is to assume that concepts are not given at all. They are neither acquired empirically nor built-in. Instead, the meaning of every concept or rule is contextually determined by other concepts and rules. Significations do not break through the network of significations always expressed in terms of signifiers which are expressed in terms of still more signifiers. There is no correlation with a language-independent reality. Meaning of signifiers is always derived 'laterally' along the network of signifieds expressed in terms of signifiers, rather than 'down' to some grounding. In linguistics, this approach is often called structuralism, and de Saussure is certainly a primary figure in this movement. It is obvious, yet important, to note that structuralism in linguistics has emphasized phonology, morphology, and syntax, usually to the exclusion of semantics. A structural phonology based on features does not need the features to be grounded in reality or to be innate in order to provide a useful and satisfying account of the sounds of language. An approach which can simply give some sense of order to the sounds of many particular languages is satisfactory, regardless of whether the features correspond directly to some aspect of physical reality. In practice, however, phonological feature systems are usually

grounded in either articulatory or acoustic studies, thus giving them additional legitimacy.

For Hegel, there is nothing beyond language or what is linguistically described. This is a version of classical idealism in which, so far as we are concerned, all we encounter is ideas which have no grounding apart from the system of ideas in which they appear. This radical contextualism is also one of the driving forces of postmodernism. Rorty and other 'postmodern' thinkers make the relativistic claim that neither truth nor meaning can be obtained from or connected to the real world because the 'world' from which we would obtain them is already linguistically 'saturated'. In linguistic structuralism and much philosophical postmodernism, all is arbitrary.

E. A Search for a Third Alternative

It seems we are trapped in an intolerable dilemma. On the one hand, the semantic tradition in which Chomsky participates, summarized by the two assumptions we stated at the beginning of this section, allows no fundamental ambiguity. Disallowing fundamental ambiguity is a consequence which we have found to be false in the course of work in translation, and which we will later claim to be false on other, ethical grounds. This tradition DOES have the virtue of addressing the problem of how language might be grounded in reality so that it is not completely arbitrary. But the price for eliminating arbitrariness in this way is exorbitant, for it eliminates the possibility of fundamental ambiguity. On the other hand—and this is the other horn of the dilemma—the structuralist approach can allow for fundamental ambiguity, but it does so by making arbitrariness a basic fact of language. We would like to have both fundamental ambiguity and nonarbitrariness, i.e., groundedness.

Others have explored the possibility of explaining the nature and acquisition of concepts as nonarbitrary yet fundamentally ambiguous. We have already looked at one, the linguist George Lakoff (1987). He brings together work by many researchers, especially psychologists (including Kay, McDaniel, Brown, Berlin, Ekman, and Rosch), who present evidence for our concepts being based on properties of our physical bodies and nervous system. Lakoff's main result, an approach to metaphor, is significant.

We would also like to briefly mention two philosophers who have offered a grounding for language that accommodates fundamental ambiguity.

The first is Heidegger, who made several attempts to work out possibilities in this area. The best known is his great work *Being and Time*. In this work, language is the medium of the emergence of the world—the world in which and with which the individual is engaged in all sorts of ways (practical, idle, theoretical, etc.). Therefore, the idea that this world might stand independent of the use of language or of the being who uses language, and that certain words that represent this independent-standing reality are consequently endowed with univocity—this idea cannot be wedged into Heidegger's account. For him, the grounding of language is our way of being-in-the-world, where our being and our world are not separate. So the world for Heidegger is at once grounded, determinate for any language user, and yet not fundamentally unambiguous.

The second philosopher is the later Wittgenstein, for whom meaning is a kind of use. For the 'late' Wittgenstein, words do not essentially stand for things in an objectivist correspondence to the world, but function in a wide variety of linguistic practices which are in turn embedded in larger social practices and forms of social life. To acquire an understanding of these words is just to enter into and participate in these practices successfully. We learn how things are done in our community, in conjunction with other people. To learn to speak a language, then, is to enter into many ongoing social practices of which naming, description, and assertion are only a few of many things that can be done with words. The later work of Wittgenstein is remarkable in that it constitutes a public abandonment of his earlier attempt to develop an objectivist approach to language along the lines of the assumptions at the beginning of the section.

The views of Lakoff, Heidegger, and Wittgenstein have conceptual connections one with another. We bring them up here to show that there are attempts which seem to implicitly recognize and cut through the dilemma that we have outlined. They are attempts to develop theories of meaning which are not reductionistic in the manner of Chomskyan linguistics (that is, they are not based on bottom up composition from universal semantic atoms), and are not arbitrary in the mode of the radical structuralists.

NOW OUR MAJOR OBJECTIVE FOR THIS PAPER (AFTER POINTING OUT THAT DOMAIN LANGUAGE, ALTHOUGH DESCRIBABLE REDUCTIONISTICALLY, IS CREATED FROM WITHIN GENERAL LANGUAGE) IS TO PLACE ON THE AGENDA OF LINGUISTICS THIS QUESTION: HOW CAN WE FURTHER DEVELOP AN UNDERSTANDING OF LANGUAGE THAT ACCOMMODATES BOTH FUNDAMENTAL AMBIGUITY AND NONARBITRARINESS? Only by answering this question adequately can we account for the possibility of general language. And because domain

language is a special case of general language, we need this answer even to account for domain language—though when artificially considered autonomous, domain language appears to be possible on the reductionistic assumptions with which we began this section. That the search for such a theory is plausible and that, as Lakoff has deeply sensed, such a theory would change the course of contemporary linguistics—these are ideas we want to place on the agenda.

In the next section, we will discuss ideas that can be supported by the insights of another philosopher, Emmanuel Levinas. We hope these insights and the broad account we will offer will exemplify the inventiveness and richness that will increasingly come into linguistics as the new question is taken seriously.

IX. AN APPROACH TO CATEGORY ACQUISITION IN GENERAL LANGUAGE

We are looking for a grounding of general language that is normative, that does not run afoul of any form of the problem of the given, and that allows for fundamental ambiguity. We will sketch a novel approach to this quest that neatly accommodates the hard facts of translation experience discussed earlier in this paper. This approach differs radically from a Chomskyan one.²⁴ Chomsky views linguistic theory as a branch of **INDIVIDUAL** psychology (Chomsky, 1986). The approach taken here is a **SOCIAL ONE**, or rather an **ETHICAL ONE: LANGUAGE IS POSSIBLE ONLY IN VIRTUE OF OUR RELATIONS WITH OTHER INDIVIDUALS**—which we will show to be relations of obligation.²⁵

What can be meant by this odd assertion? First of all, let us recognize that we often view other people as objects that possess properties and that populate an objectivist universe—objects that can be adequately represented by declarative sentences. But for Levinas,²⁶ viewing them this way 'totalizes' them—brings them under a single purview by means of which the person who holds this view reduces them to repeatable and replaceable role-takers in a vast system. When people are brought under this purview, the cognitive totalizing process is analogous to **POLITICAL TOTALITARIANISM**;²⁷ its motivation is 'the conquest of being by [the mind of] man over the course of history' (1987, p. 48). Levinas means by this analogy to express what he considers a profoundly unethical aspect of the quest to gain intellectual command of social reality and by this means to consider others as existing for our intellectual if not our political use. For it is possible to regard others not as objects but rather as subjects, which means regarding them in the way we regard ourselves when we take into

consideration our own inward life, our consciousness, with all our hopes and fears and feelings, our freedom. We can acknowledge their 'otherness' with respect to ourselves.

It is precisely this otherness that we obliterate, or try to obliterate, when we view them as objects. Jean-Paul Sartre considered the otherness of others a fundamental threat to our own identity and freedom, since they present to us always a freedom we cannot reduce to our systematic control, a freedom that can surprise us, oppose us, confound us. For Sartre, life is a quest to consolidate our personal identity, which means that others trying to consolidate **THEIR** identity may threaten our project. And indeed, insofar as we consider others threatening, we will seek in the name of damage control to suppress their independence in a totalitarian way. Their otherness can and will constantly disrupt the complacencies of our systematizing, controlling mentality, just because it does not fit—it cannot fit—into any conceptual scheme. The subjectivity of the other always lies outside of or beyond any ordering of the world as a system of objects.

As we shall see, whether we regard people as others or as objects is an ethical question with linguistic consequences, not a linguistic question with ethical consequences.

How does this apply to our discussion of Chomsky? His is an objectivist view, for he holds that language is a system of declarative sentences, and that words are names, in the broadest sense, concatenated according to syntactical rules. The world, accordingly, is a system of states of things and of events brought about by, or happening to, such things. Objects and their happenings—that's what there is. Not only is Chomsky's theory of linguistic competence a part of individual psychology; the world to which the sentences produced by competent speakers applies is a totalized world.

This restricts the role of other people in the determination of meaning to the role of denotata—objects represented. That they might be regarded as regarding the world themselves does not and cannot figure into Chomsky's theory. It does figure into Levinas'. For him, to be a person is to recognize or acknowledge the subjectivity or 'otherness' of others. I cannot be a subject, an interiority, unless there is something external to me. For there to be an inside requires that there be an outside. Levinas argues that to conquer the world by systematizing it intellectually is to grasp it with one's mind; quite literally, to comprehend, to 'take it into oneself,' to extend the boundaries of oneself over it. This eliminates or profoundly obscures the

externality of others by reducing them to the character and status of objects.

The history of philosophy stands witness for Levinas here, because as soon as the world began to be considered a system of objects falling under categories determined by their properties, the properties migrated to the side of the perceiving subject, in the mode of ideas being experienced, and it became problematic whether they could be said to exist 'out there' in the world at all. In the *Meditations*, Descartes devised his several proofs for the existence of God precisely to establish that objects do exist independently of minds, being unable to find any other basis for believing this. Locke tried to forestall the migration; following Galileo, he distinguished primary or quantifiable properties from secondary or qualitative ones; both exist in the mind, as our ideas, but the primary ones correspond to properties of which the object 'out there' is a substrate lying beyond our knowledge, like Kant's 'thing in itself.' Since that 'object' is individual and not repeatable, we can obtain no idea of it. By a series of devastating arguments, Berkeley demolished the tenability of the distinction between primary qualities and secondary ones: as far as we can possibly know, both are only ideas, and consequently we are left with no good reason at all for believing in the existence of anything but our own subjectivity (with the possible exception of God's subjectivity, since, with objects gone, there's nothing else that will explain where our ideas come from, assuming that we ourselves do not produce them at will). This subjectivist development was then recycled, with Kant working out a compromised version of objectivity consistent with Berkeley's and Hume's proposition that we know only our own ideas. Out of Hegel's dismantling of Kant's effort, varieties of subjectivism ensued, including Romanticism, Existentialism, Phenomenology, and contemporarily, certain Postmodernist positions. Once the world is regarded only as a system of objects, this slide follows inevitably as a series of logical consequences.

The only items that cannot be conquered with the mind and drawn over to the side of the thinking subject, the only items that cannot be reduced to objectitude, are **OTHER** subjectivities. The interiority of other people is the one irreducible exteriority. For Levinas, to be a self at all consists in acknowledging other selves.

Being face to face with others, acknowledging their needs and feelings, places us under obligation to treat them accordingly. The instant we begin to use them for our own purposes, we reduce them to object status; hence, to see them as subjects is to be under obligation **NOT** to see them this way. Or, to put the point differently, we sense

from them the same gentle demand, as we respond to their inwardness, as we want to make upon others to recognize our own needs and feelings—a demand not to neglect, not to ignore need, not to allow to suffer or die.

Notice that the fact that we feel the ethical obligation²⁸ does not imply that we will act accordingly. We may resist it. We may refuse to let ourselves be who we really are. But when we do, we implicitly acknowledge, by our act of refusal, our obligation to the other (in the way that we take account of someone in order to act dismissively toward them—in order to act as if we weren't taking account of them).

With this Levinasian background in mind, we can sketch the broad outlines of a theory of how language is possible. Though not Levinas' theory, it draws upon his basic insights about the conditions of selfhood.

First, let us point out that the obligation or ethical demand of which Levinas speaks is not a matter of moral rules or social 'shoulds,' but of an immediate face-to-face relationship that constitutes our very being, prior to our acquisition of moral rules and social 'shoulds.' A passage from *The Adventures of Huckleberry Finn* illustrates the difference well:

Jim said it made him all over trembly and feverish to be so close to freedom. Well, I can tell you it made me all over trembly and feverish, too, to hear him, because I begun to get it through my head that he WAS most free—and who was to blame for it? Why, ME. I couldn't get that out of my conscience, no how nor no way. It got to troubling me so I couldn't rest I tried to make out to myself that I warn't to blame, because I didn't run Jim off from his rightful owner; but it warn't no use, conscience up and says, every time, 'But you knowed he was running for his freedom, and you could 'a' paddled ashore and told somebody.' That was so—I couldn't get around that no way I got to feeling so mean and so miserable I most wished I was dead. I fidgeted up and down the raft I knowed very well I had done wrong, and I saw it warn't no use for me to try to learn to do right; a body that don't get STARTED right when he's little ain't got no show—when the pinch comes there ain't nothing to back him up and keep him to his work, so he gets beat. Then I thought a minute, and says to myself, hold on; s'pose you'd 'a' done right and give Jim up, would you felt better than what you

do now? No, says, I, I'd feel bad—I'd feel just the same way I do now. (Twain, 1953, pp. 112-113, 116.)²⁹

The last sentence of the Twain quote reveals a face-to-face relationship underlying and different from social shoulds. Obligations of the sort we are interested in cannot be reduced to generalizations or rules but flow from one person's reading of another's subjective perspective on the world. This point will have significant implications, as we shall see: neither general linguistic performance nor any other ethical activity can be adequately modeled as rule-following behavior.

Now the influences and constraints from reality that make every form of discourse possible make up a subset of the broad range of moral obligations toward others under which we find ourselves. Speaking involves trying to make oneself intelligible to others; to mean is to strive to be understood. Thus by speech we acknowledge the need of the other, whose dialect, social background, emotional state, and so on, guide and constrain not solely our choice of **WHAT** we will mean but, as we shall see, **HOW** we can mean—the form as well as the content of expression. Even in speaking to oneself, others who are absent, or possible others, guide and constrain us. (With some, we may characteristically employ patterns of utterance that generative grammarians would call degenerate, and with others we may speak in syntactically canonical sentences.) And similarly, in trying to understand another person who is speaking we regard him or her as striving to be intelligible to someone else, possibly ourselves. Hence to enter into the circle of discourse means to regard the other's need to understand as normative for us and to regard the other as regarding yet others' needs as normative. On this approach, **THE NON-ARBITRARINESS OF LANGUAGE IS GROUNDED NOT SO MUCH IN THE STRUCTURE OF THE WORLD, BUT BY THIS NECESSITY: TO SPEAK REQUIRES SEEKING TO SECURE SUCCESSFUL UPTAKE BY SOME OTHER OR OTHERS.**

The idea that understanding another's utterance as meaningful is perceiving or understanding it as that person's act of taking others into account—this idea implies that something more is going on here than the production of sentences. In Levinas' terms, what's taking place is **A SAYING OF** a 'said' rather than just a 'said.' The said is abstracted from the saying, after the fact. **'MEANING-FOR' IS CENTRAL TO THE POSSIBILITY OF MEANING; WHAT AN EXPRESSION MIGHT MEAN FOR OTHERS IS NORMATIVE FOR OUR USE AND DETERMINES 'MEANING-OF.'**

We are well aware that the tradition in which generative grammar developed—the tradition that Lakoff calls 'objectivist'—supposes the semantical component to be available prior to use, prior to all

considerations of pragmatics, and that the source of its availability is regarded as a secondary issue to be worked out independently of the theory of the conditions of sentence-production. The kind of alternate approach we are here exploring holds, as we suggested in Section VIII, that this semantical project cannot in fact be completed, or, to put the point more penetratingly, that its completion requires a retroactive dismantling of assumptions about the conditions of sentence production. It will turn out that the dimension called pragmatics (though not as usually conceived), which is typically relegated to an incidental status, is actually CONSTITUTIVE of meaning. As we have said in some ways already and will say in other ways presently, meaning involves fundamental ambiguity, and any position that precludes this kind of ambiguity will ultimately come to grief. (We need occasionally to remind ourselves of the embarrassingly obvious: The enterprise in which we are all involved is an intellectual rather than a political one, and if one theory can accommodate more of the manifest features of reality than another, then by that fact alone it posts a claim to supremacy.)

Let us speculate a bit about the ways in which ethical obligations to others guide and constrain—are normative for—meaning. Think first about the issue of arbitrariness. The words on any level of a particular language are arbitrary in one sense—that a particular sound or inscription serves as this word or that may be merely conventional—but in another sense, they are not arbitrary at all. In a particular situation, to accomplish our purposes, we feel constrained in our choice of words and forms of expression. We cannot communicate without using the forms of speech and vocabulary conventionally accepted by our audience, and which conventions apply when and where is determined by the need of the people we are speaking to or hearing. This relativizes speech to relationships between individuals—the way you talk with Tom is different from the way you talk with Susan or your granddaughter or someone who is just learning your language. For a Chomskyan, this is often a matter of degenerate usage, irrelevant to the possibility of language. But we say **THIS RELATIVISM LIES AT THE VERY HEART OF THE POSSIBILITY OF LANGUAGE, BECAUSE IT IS THE VIEWPOINT OF THE OTHER (AS WE VIEW IT), HOWEVER UNFOUNDED OR INACCURATE, THAT PROVIDES THE FUNDAMENTAL, ALINGUISTIC, NORMATIVE INFLUENCES UPON LINGUISTIC PERFORMANCE. AND THAT FUNDAMENTAL, ALINGUISTIC INFLUENCE ON SPEECH IS OBLIGATION TO THE OTHER.** It is ethical.

Let us push the inquiry further. Imagine some object, such as a pad of paper. This, says Levinas in *Totality and Infinity*, is not in the first instance a cognitive object. Prior (in a logical sense) to being a cognitive object, it is an economic³⁰ object: it is something I can grasp, possess, and take from or give to you. It has an economic

meaning. (The economic dimension of the meaning escapes us when we just talk about semantics. The language of much linguistic theory is a language that peels off only a thin aspect of reality, leaves much of the rest out, checks up on itself, and confirms that it captured everything.) Now when engaged in taking this object or wanting it or giving it away or rejecting it, I acknowledge you or others as others, as the being(s) I need to protect it from or give it to; I must do so in order to regard this as something either of us might possess. Therefore, I am first of all an ethical being who can be generous or selfish. This doesn't mean that ethics comes into play first chronologically, followed by economics, and subsequent to that, cognition. It means instead that cognition at its heart is essentially economic, and economics at its heart is essentially ethical. An analytical priority is operative here, not a chronological one. To be a cognitive being in our peculiar language-using way is to be an ethical one. The priority of ethics and economics deserves further discussion. Levinas has written extensively on this topic.

To be an object of cognition is, at least potentially, to be an object that can be used, deployed in some fashion for some purpose. This is true even for abstract objects like numbers, which can be manipulated in various ways. And thus to be an economic object is simultaneously to be an ethical object, for it can be used on others' behalf or on one's own, in creative expression or in an act of spite or vengeance, as a gift or as a theft, etc. Insofar as we use an object ethically, we defer to, or at least caringly take into account, another's need—perhaps to understand my action, perhaps not to suffer from it, possibly to be sustained by it. My felt ethical obligation is the other person's economic or cognitive need—or it may be my ethical need to fulfill his or her obligation.

So we may use a word in a wildly non-standard way because we know that's how another understands it, or because that will amuse or please that person; or we may invent a metaphor that dislocates a word from its standard associations and thereby enriches its meaning for all who hear, just because the interests, purposes, or needs of the other suggest this. In these ways, we adapt, precisify, or even create words, all because others ubiquitously mediate our access to reality.

What is more, we do this, most often, undeliberately—totally without calculation. No 'standard usage' is presupposed that, once in play, serves as a platform for creative variation. On the contrary, to be in a position to speak at all is not merely to be endowed with sentence-production capacities, but also to view the situation or subject-matter of which one speaks as being viewed by another or others. Therefore,

metaphorical creativity and other neologisms can be completely spontaneous. (Let us emphasize what we said before: even if we're self-serving, using other people, in order to be so, we must grant them an economic, ethical, and cognitive autonomous perspective on the world as a condition of our speaking and acting intelligibly.)

In the way we have described, the alinguistic or prelinguistic obligation I have to the other that guides and constrains my development and even my formation of categories **DOES TWO OTHERWISE INCOMPATIBLE THINGS AT ONCE**: (1) it generates just the sort of fundamental ambiguities that we observe in speech and texts—ambiguities that cannot be included in advance on a list finitely long—**AND** (2) by the same stroke it establishes stabilities of usage of just the sort that we observe—stabilities that make it possible for us to read and make at least some sense of texts in our own language that are centuries old. The stabilities come because acknowledging in one's speech the authority of others' need for intelligibility tends to subdue or override aberrations of use. All this contributes to the conditions of non-arbitrariness that, together with fundamental ambiguity, we believe to lie behind speech and writing in order for language to be as we observe it to be. The non-arbitrariness and the fundamental ambiguity, on this account, spring from the same source.

The account we have briefly sketched suggests **A THEORETICAL POINT OF VIEW FROM WHICH REALITY POSSESSES THE FEATURE OF INEXHAUSTIBLY MULTIPLE CATEGORIZABILITY**. This point of view accommodates the insights of Lakoff. He says, as we have seen, that the kinds of categories that dominate for us are those associated with our relative size, our upright orientation, our flexibility and specific gravity, and the power, dexterity, and/or keenness of our particular monitoring, interventionary, and manipulative equipment, our senses, and our appendages. These orientations, capacities and limitations belong not just to the individual but to those who are other than the individual; for each speaker/hearer speaks and listens as one whose utterance or understanding may go summarily awry if it doesn't sufficiently accommodate the physical orientation and capacities of the other person (who accommodates himself or herself to others yet in the same sort of way). The account sketched here also incorporates Heidegger's work on the relation of purpose and meaning, but extends and enriches it by adding that the purposes in terms of which we categorize objects functionally and economically are not exclusively one's own; others' purposes too play a fundamental role, and must be anticipated if one is to accomplish one's own purposes. Heidegger expounds a version of this insight, different from ours, and not far removed from the later Wittgenstein's view of practices. We are all

essentially with others in the world, and our language, repertoire of actions, and even moods and attitudes—our individual identity—all appropriate and express their ways.

Thus, we believe, the basic principles of Wittgenstein's account of meaning are also captured by the theory we have been sketching. All he says seems sound; the faculty for speech is in fact repositied primarily throughout the community of speakers and not within any individual member of it. (Social constructionists in psychology, influenced by Wittgenstein and also Vygotsky and others, have developed this view insightfully and argued for it persuasively. See, e.g., Rom Harré, *Personal Being*; see also Wilfrid Sellars, 'Empiricism and the Philosophy of Mind'.) Anthropologists may in one way be said to study practices and institutions, but they are more concretely, less abstractly, described as studying patterns of individuals responding not just to one another, but responding to one another responding to one another. Practices are rooted in individuals relating to individuals relating to individuals.

Let us now ask, how does the account we have described sketchily make meaning non-arbitrary? Does it solve the problem of non-conceptualizing cognition in the application of concepts to reality and in the acquisition of concepts in the first place? We think the answer might be worked out in the following general direction:

As far as the application of concepts goes, in our basic cognitive contact with reality, as we categorize this item or that, we simply and straightforwardly employ concepts. It is a mistake to think that we need to pre-identify whatever we apply concepts to. Kant worked out this solution as it applies both to the general schemata of cognition, such as sequence, juxtaposition, and causality, and to empirical concepts such as those of size, shape, velocity, texture, color, etc. The very idea of an object is the idea of a conceptualized entity, and the separation of the abstract concept of that object and its concrete material is achieved only in analysis and not as a sequence of stages of cognition. Because ANY access to the object or even to features of the object (which for present purposes are themselves objects) involves the application of concepts, it makes no sense at all to speak of correlating an independent word or concept to an object. This incidentally is the position of Jean-Marie Zemb, whom we have already mentioned; he says the answer to the question, 'What controls our conceptualization of the world: our view of it or the world itself?' is 'Both.'³¹ We conceptualize the world in cognizing it but will run up against real-world limitations that may force us to revise.

The account of meaning we have been outlining shows how the speaker is engaged, as a condition of speech, in linguistic practices not only of asking and responding, of giving orders, of endorsing and vilifying, and so on, but of subscribing to and circulating a general thematization of reality. Our account suggests that the consistency with which we deploy concepts is as much a function of physical orientation and capability, expectation, purpose, compassion or impression management, and prevailing practice as of dictation by reality. Precisely because reality can be viewed in multiple ways—inexhaustibly multiple ways—it does not prescribe any one view over the others. Yet it does play a guiding and constraining role, as evidenced by the fact that it cannot be viewed in any old way whatever. (That a set of possibilities is openly infinite does not imply that it includes every possibility.)

Without all the other considerations we have mentioned, all rooted in the face-to-face relations of which Levinas has written, reality itself would have to dictate directly how it must be read, and given this severe limitation, it seems necessary for us to pick up its signals in advance in order to know how to respond to it cognitively. In that case, a non-conceptualizing cognition would be required in order to apply concepts. And there would consequently be only one correct way to view the world, or at least only one basis for views, precluding fundamental ambiguity.

We can put this point in another way: Any theory of the conditions of linguistic performance, such as generative grammar, that precludes fundamental ambiguity, entails that one and only one word sense is correct for any given item, and therefore reality itself must, in a direct, non-mediated fashion, determine which this will be. Hence any such theory will face the difficulty of correlating primitive terms to reality and the attendant problem of what we have oxymoronically called pre-cognitive identification of that reality.

We might extend this position to the economic and ethical dimensions of cognition. To apprehend an object is not only to conceptualize it, but to regard it also in functional, economic terms, relative to one's purpose, hopes, anticipation of possibilities, fears, and capabilities, and these terms are set in the even broader ethical context of the need, whether for their sake or one's own, to anticipate the possible responses of others. These dimensions all come to bear together with—simultaneously with—the application of concepts; as we said, the priority they enjoy is logical rather than chronological, and their distinctness exists in analysis and never in the objects of cognition.

But if it all works in this way—if the non-conceptualizing cognition problem is an artifact created by exclusion, in the determination of meaning, of our face-to-face relations to other people—if we do not in fact compare our concepts to reality—how can we have any confidence in our application of concepts or correct them when this confidence is shaken? For the answer, we can borrow a page from Hegel and the pragmatists who developed their position out of the matrix he created. If our conceptualization of reality is faulty, we shall discover this not by comparing it with unconceptualized reality, but in further experience, by additional applications of concepts³². This is how we actually run up against and are corrected by reality. Indeed, one good account of the strategy of science says that it consists in devising ways in which to push further experience toward a limit where, if possible, prior conceptualizations will be discovered inadequate. Reality may allow an inexhaustible range of characterizations, but it doesn't allow absolutely any characterization whatever, and indeed can be rather unforgiving of carelessness or irresponsible judgments. It plays its role in the refinement of concepts without the need for accessing reality prior to conceptualizing it.

The approach we have been exploring seems particularly promising for language acquisition theory. John Shotter, a widely influential British psychologist, watched hundreds of videos of mothers with infants, and came after long study to the conviction that in the early months, mother and child do not form a simple dyad, the mother responding to the child and the child to the mother. Instead, the mother relates to the dyad consisting of the mother and the child; she relates to the child as responding to her. Thus she interprets even the child's random gestures and facial expressions as meaningful, which is to say, she interprets them as sensitive to her, and consistently over time gives the child a response that constitutes the child as responsive (Shotter, 1984, pp. 57-62). Her conceptualization of the child is ethically governed. In acting according to the conceptualization, the mother guides the child in conceptualizing her in a similar ethically governed way. Though we believe much work needs to be done in this area, the approach that Shotter has pioneered is very promising.

* * *

The view we have briefly portrayed here, on the basis of Levinas' views of the constitutive role of our recognition of others' subjectivity in the meaningfulness of all we do and say, suggests the way in which human speakers appropriate into their usage new and unpredictable word-senses. Those senses come through their way of resonating with others' ways of viewing things. This connects with precisely what we

have found human translators must do when translating general language texts. It is not enough for the translators who encounter ambiguity to select a word-sense from a pre-established list; they must instead, by virtue of their responsiveness to others' perspectives, discover in those perspectives senses that could not have been anticipated.

X. CONCLUSION

In the foreword to this paper, we suggested that the general/domain distinction would have implications for two endeavors: machine translation and Chomskyan linguistics. On the view of this paper, one implication is that these endeavors have shared an approach that assumes ambiguity is only superficial and thus limits them to treating domain-specific language. This explains why machine translation has failed to produce fully-automatic high-quality translation of general text. It also encourages exploration of additional approaches to language.

General language and domain-specific language are profoundly different in the way they *can* be treated. Because the significance of this difference has not previously been appreciated sufficiently—because it has been assumed that treatments of domain languages can be extended to general language—a supposition has circulated that all language is essentially the same and that general language can be modeled on domain language.

That this supposition has spread far and wide is not surprising. It seems to have arisen naturally from the troika of traditions we have mentioned in this paper—the Galilean mathematical paradigm of reality, the quest for fully-automatic machine translation, and the Frege/early-Wittgenstein/Chomsky conception of language as a system of sentences that possess their sense wholly independently of their use or 'force',—wholly independently, that is, of all considerations of pragmatics. The supposition has also been supported by certain contemporary developments, such as formal language theory, automata theory and computers, that for many people seem to cry out for deployment as models of that sector of reality that heretofore has resisted analysis almost successfully, namely the human mind and its activity. Further, domain languages have proven to be extraordinarily useful, another fact that makes tempting the idea that the properties of domain languages are sufficient to explain all language whatever. We can accomplish much by devising languages that are both rigidly 'grounded' in one selected general-language context and computable.

But we think a careful consideration of these matters does not support the idea that when fully analyzed all language will be seen to be like domain language, but rather the historical fact that domain languages are created by people to restrict general language for specific purposes.

Moreover, we have expressed our conviction that domain languages could not come into being in any other way. They can only be created within the framework of a functioning general language. Even though they can be treated as if they were autonomous, they are not and could not be. This calls into question Chomsky's version of an innate, genetically endowed language faculty, especially as regards concepts. Because the idea of this faculty applies only to artifacts, i.e., domain languages, it too can only be an artifact—perhaps a myth, not dissimilar to Plato's conception of a premortal existence, for contemplating how domain-language sentences might be produced if (somehow) they were not artifactual.

We have noted that various more recent approaches to language, which Lakoff calls 'experiential', deal better with the dynamic nature of general language. But they have this apparent disadvantage: insofar as they are correct, general language is not fully computable. But this is no actual disadvantage, since we claim general language is in fact not fully computable. Prudence dictates that we say time will tell whether we shall ever build machines that translate as well as humans, but the experience of devising translation models that we have described in this paper suggests strongly that we shall never build such machines on the current model of sequential, deterministic, objectivist computers.

In the meantime, the practical issue is not whether to choose between 'domain' linguistics or 'general' linguistics. Obviously we need both. The practical issue is to decide when to treat a text as domain and when to treat it as general. This implies the need for better methods of determining the typology of a text. But existing computational techniques should not be abandoned. Whenever a large body of texts can be treated as belonging to a domain, existing techniques of machine translation can probably be applied with success and practical value. However, we propose that it would be wasteful to continue to attempt to apply current techniques of machine translation to dynamic general language, except to produce rough translations not intended for publication. There is no need to agonize over the limitations of current techniques. Instead there should be a natural division of labor, according to individual inclination and opportunities, between refining the application of current techniques where appropriate and discussing radically new approaches to general language. Those

who study general language need to have patience in trying to find applications for an experiential approach without slipping into objectivism (because of computation envy) or sliding into fluff.³³

For general language, we have drawn upon certain insights of Levinas and our own theoretical work to present a view of how language is possible, for both adults and children, through general cognitive and physical capacities (which may well be genetically determined) and through recognition of the 'otherness of other people'. Note that our proposed basis for the possibility of language, that which is given, is pre-linguistic: bodily capacity for sensory input, recognition of otherness, and innate cognitive capacities. On this view, general language is not arbitrary (being grounded in our obligations to others and limited by encounters with reality) yet it is ambiguous in a fundamental way. Thus, when dealing with language that is not restricted to a domain, we reject both objectivism and radically relativistic structuralism. Although we have presented the barest outline of a preliminary and tentative answer to the problem of concept/language acquisition, what is much more important than our current opinion is careful attention to what we think should be a new question on the agenda of linguistics, the question of how we can account for the possibility of language as simultaneously grounded (non-arbitrary) and fundamentally ambiguous. We think that by allowing us to see language from a fresh angle, this new question of how language can be grounded yet ambiguous will bear fruit in linguistics and natural language processing.

Taking this new question seriously frees us from the prison of objectivism. The fundamental ambiguity of general language allows us to continue creating interesting and surprising new domains indefinitely. Since we are not prisoners of any particular domain but are free to create, enter, exit, and redefine domains, these domains are not actually prisons at all. Nevertheless, suppose that in some fantastical manner a human being were in perception, thought, and expression completely taken over by some particular domain language. This individual could consequently contemplate reality in one and only one way. No discovery would be possible, except of terrain not yet encountered, for everything that could be apprehended from a particular physical point of view would eventually be apprehended. The world would in this sense be all surface, no depth. Since this person would not discover truly novel aspects of anything, it is hard to see how metaphor would be possible—even the simplistic sort of metaphor that is immediately reducible to some literal expression or other. Would such a person not be trapped in a sort of psychological prison? We should be content, even grateful, to have unambiguous domain language (in which apparent

ambiguities are superficial and can be resolved using homograph numbers) at OUR disposal. But if general language were really only domain language and restricted us to a single basis for viewing the world, WE would be at the disposal of this language.

Unambiguous general language would be the ultimate prison.

ENDNOTES

1. John Hutchins (1986, p. 21) notes that Descartes, in a letter to Pierre Mersenne dated November 20, 1629, described a proposed universal language in the form of a cipher where each cluster of equivalent words in various languages would be given a unique numeric code. Then a text written in these numeric codes would supposedly be understandable to anyone who has a code book for their language.
2. The stratificational 'lexeme' may be equivalent to LTU. Some machine projects have used 'lexical unit' as equivalent to LTU. A colleague, Chris Larsen, suggested 'lexiconcept' as an alternative to LTU.
3. One can think of a stone as a piece of clay that has become hardened, just as a terminological unit has a fixed meaning within the context of a certain domain of knowledge.
4. A 'storm watch' indicates that a storm **MAY BE** approaching; a 'storm warning' indicates that a storm **IS** approaching.
5. In 1990, I presented this study as a series of lectures as a visiting professor at the Collège de France, and in 1991 it was published in *Les Cahiers de Lexicologie*.
6. English-French asymmetry has been studied extensively. See, for example, Garneau, 1985.
7. Lithuanian has a specific verb for the stage at which nuts begin to form after the tree blossoms, for which we have no equivalent in English (personal communication with Sue Ellen Wright).
8. Even in English there are anomalies. James McCawley points out (personal communication) that although *you're welcome* is usually an acceptable reply to *thank you*, an exception is the *thank you* in response to a compliment.

9. One might object by pointing out that *faire un geste de la tête* is symmetrical with the expression *shake one's head*, and thus we do not have true asymmetry. However, one cannot make a complete list of all the expressions in which *geste* might occur and how each will be translated.

10. When source and target term equivalence pairs form a simple binary relation, we have an example of Peircian secondness without [dynamic] thirdness. (Personal note from John Robertson)

11. The usefulness of a 'stupid' word processor is reminiscent of John Searle's Chinese box question of whether a person in a box blindly following instructions on how to translate a text into Chinese can rightly be said to 'know' Chinese.

12. But only when GUI supplies the kind of speed that will satisfy die-hard, impatient users accustomed to DOS response.

13. Here we use Chomskyan linguistics to refer to Chomsky's own writings and those of other linguists who follow the 'party line'. Any approach which departs from Chomsky's approach in basic ways would not be considered Chomskyan linguistics.

14. James McCawley has suggested another similar example. If one is talking about the perfective, *have* can precede but not follow the progressive *be*, so one might assume that (a) *They have been smoking pot* is acceptable but (b) *They are having smoked pot* is not. However, (b) is acceptable if considered analogous to *They are having scrambled eggs*. One could give both readings to (b) without violating the principle of treating sentences in isolation, simply by putting two entries in the lexicon under *have*, one as an auxiliary and one as a main verb. The crucial issue is whether ALL contextual influences can be reduced to lexical entries and features. The author's experience with machine translation suggests this is not the case.

15. James McCawley rightly points out (personal communication) that there are at least two ways to speak of a sentence-like object as acceptable or unacceptable. One way is to treat the object in isolation, and another way is to treat the object relative to a meaning and

information in context. However, if a sentence is **NOT** treated in isolation, syntax is no longer autonomous (of meaning).

It would be possible to develop a linguistics in which sentences are treated relative to a meaning. Obviously, such a linguistics would not be a Chomskyan linguistics and would require a total formalization of meaning in order to function as a machine.

16. Although one may not agree with Chomsky's advocacy of anarchy, his political views are certainly not boring. In the documentary film, "Manufacturing Consent", Chomsky remarks in an interview that he has never found a connection between his political activism and his linguistic theory. Perhaps this is because his politics, which deals with human rights, could only be described linguistically by an approach which goes beyond the bounds of Chomskyan linguistics.

17. No offense is intended here to any watchers of soap operas, because there is a non-boring aspect of soap operas that transcends the plot, namely that many watchers care very much about the players on the television screen and treat them as real people with real pain. But even a soap opera fan would probably not argue that their favorite series is a source of novel plot development.

18. Lakoff, as a proponent of Generative Semantics in the 1960s, challenged the autonomy of syntax, but was pushed out of the mainstream of generative grammar. In *More than Cool Reason*, Lakoff points out that his own recent work is in some ways a continued exploration of the consequences of changing this assumption.

19. Consider the sentence, 'Blessed are the young, for they shall inherit the national debt'. This statement by Senator Graham can only be understood by recognizing its similarity with a passage in the King James Bible. The scripture in the beatitudes talked about how blessed are those who are persecuted. Graham is probably suggesting that Americans are persecuting our children by placing on them the burden of a huge national debt. It is not clear how the semantic component can generate such a meaning without knowledge far beyond what could be expected to be found in a lexicon. Yet if the pragmatic component is allowed in just one case to generate a meaning rather than select among alternatives presented by the semantic component, then there would be no well-defined stopping point as more and more aspects of semantic

interpretation would be placed in the pragmatic component. This would result in a very different model of language in which the semantic component cannot always generate all the possible meanings of a sentence, and whose pragmatic component could 'erase' an asterisk placed on a sentence by the semantic component.

Another class of sentences for which adequate meanings cannot be generated by the competence component is illustrated by the sentence "The theory of relativity is blue". The context is an elderly man asking his nephew to get a book from the next room. The man does not remember the title, but refers to the book by topic and color. In context (i.e. knowing that the sentence is intended to identify a book whose title is not known) it is easy to generate a paraphrase such as "The book which concerns the theory of relativity has a blue cover". However, without context, one would have to consider the possibility that every case of incompatibility of attributes could be the identification of a book. Of course, the real problem is that there could be any number of other possible interpretations, limited only by context.

20. In the real world of LSP (Language for Special Purposes) texts, we still find a great deal of ambiguity. In this paper, domain language is intended to refer to the extreme case in which there is little or no ambiguity. The boundaries between general, LSP, and domain-specific texts are not clean.

21. Jackendoff, in his recent work (1990), seems to be challenging the principle of autonomous syntax, but remains in practice within the confines of treating sentences in isolation and the assumptions of objectivism.

22. For some, immediate computability is all important. James Faulconer (personal communication) says that in the Middle Ages, the world was defined in its relation to God while the modern world is defined in its relation to technology, which is computable.

23. As mentioned in the acknowledgement, Terry Warner is co-author of section VIII, so *I*, more often in Section VIII and beyond, has shifted to *we*.

24. In a written exchange between James McCawley and Noam Chomsky (see *Behavioral and Brain Sciences* 3, 1990) McCawley states: "While an innate language faculty might well make available both the hypothesis 'objects precedes verb' and 'object follows verb,' with selection (—'reinforcement') deciding which one wins, it is implausible to suppose that it makes available to the learner a range of hypotheses as to the meaning of *assassinate* that includes 'kill in order to remove from political power.'

Chomsky replies: "As for the particular case McCawley mentions—namely, fixing the meaning of *assassinate*—I am aware of no alternative to the view that the concepts that enter into the meaning and conditions on their interconnections are available prior to the acquisition of the word, and that some of them (e.g., the 'aitiational' elements) are primitive. If so, then the innate language faculty does make available a range of hypotheses as to the meaning—a narrow range, presumably, if the word is learned easily on the basis of limited evidence as to use. McCawley regards this as 'implausible,' without, however, explaining why or suggesting a more plausible alternative."

Note that Chomsky admits that he is not aware of an alternative to his very objectivist view that the language faculty, as opposed to, say, social interaction, makes available a narrow range of possible meanings for a word. We will here present an alternative view that we hope many, including Chomsky, will take seriously.

25. 'Language acquisition occurs in the social context of discourse' (Bruner, 1983, p. 58).

26. Emmanuel Levinas is a philosopher living in Paris, originally a Lithuanian Jew.

27. See Raimo Anttila in the first LACUS Forum, where he describes generative grammar as a coup d'état rather than a scientific paradigm shift.

28. Ethical obligation in Levinas may be related to thirdness in Peirce. (Personal note from John Robertson)

29. The relevance of this passage was pointed out to us by Lyn Mattoon.

30. *Economy* comes from the Greek *oíkía* or *oíkòs* ('house') and that for this reason economics must be **CLEAN** as one wants to keep one's house in order. Also, if economy is amoral, it becomes robber-capitalism or robber-socialism; moral economy multiplies goods just as Christ could feed thousands with five loaves and two fishes. (Personal note from Adam Makkai)

31. See Makkai, 1993, pp. 71-72.

32. David Meyer (personal communication) suggests that this is the way neural nets learn, which is encouraging if one is looking for a new computational model that can handle general language without restricting it into a domain language. However, it is not clear whether neural nets as currently constructed recognize otherness.

33. Is there any non-objectivist computation? Is this an oxymoron? Consider Penrose's suggestion that the human mind may **NOT** be algorithmic (1989, p. 400).

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LINGUISTICS AS BIOLOGY, AS PSYCHOLOGY, AND AS LINGUISTICS

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This paper is concerned with the question of what benefit linguists can derive from regarding the various enterprises that they engage in as biology or as psychology. Linguistics can be treated as biology or as psychology (or as economics, or whatever) in two ways: **ontologically**, when one reinterprets linguistics, or some part of linguistics, so as to make its subject matter biological in nature (or psychological, or whatever), or **methodologically**, when one does linguistics the way that biologists (at least, those that one regards as good guys) do biology, or the way that (good guy) psychologists do psychology, etc. It is in an ontological sense that Chomsky's work in the 1960s and 70s treats linguistics as psychology and his work in the 1970s, 80s, and 90s treats it as biology. By contrast, much of the work of Otto Jespersen was "linguistics as biology" in a methodological sense. Jespersen understood such Darwinian ideas as selection and preadaptation far better than did most of his contemporaries, the biologists included, and he exploited them in his linguistics: he treated linguistic change in terms of differences in the viability of competing forms, which enabled him to develop an extremely sophisticated set of arguments against the Neogrammarian assumption of uniformity of sound change, and he worked out one of the few scenarios for the origins of human language that a biologist could take seriously (summarized in McCawley 1992b). Jespersen treated linguistic and cultural entities as competing for ecological niches in the same sorts of ways that evolutionary biologists treated biological entities as competing for ecological niches, but he did not suggest any biological substance for linguistic entities, except to the limited extent that he invoked human capacities and tendencies that he would presumably have said are genetically determined, such as the tendency to break up long words into parts and assign meanings to the parts, which figures prominently both in his account of language acquisition and in his scenario for the origins of human language. Linguistics that is treated methodologically as psychology can be illustrated by much of the work coming out of the University of Alberta's linguistics department, e.g. Prideaux et al. 1980.

What one can gain from regarding a particular area of linguistic research as biology or as psychology depends heavily on one's conception of and familiarity with biology or psychology: one cannot exploit knowledge, ideas, and perspectives unless one has access to them. However, linguistics, like all scientific activity, benefits from a division of labor in the communities within which it is done, and even linguists who are grossly ignorant of biology or of psychology (as most of them are) can make claims relating to biology or psychology that affect the goals and standards of their research communities and which can be related to questions of biological or psychological substance by other members of the same research communities who are more knowledgeable about biology or psychology.

To benefit from a division of labor in which biologically and psychologically knowledgeable linguists participate, though, linguists need to take claims as to the biological or psychological nature of language as relating to real biology and real psychology. The anatomy, physiology, and genetics that play a role in the acquisition and use of human languages has to be subject to the same principles that govern the anatomy, physiology, and genetics that are involved in human vision, human locomotion, bats' echolocation, and cephalopod locomotion.

In both biology and psychology, variation plays a central role: in biology, because evolution through natural selection is not possible unless there are genetic alternatives to

be selected among, and in psychology, because virtually every facet of human cognition and memory that psychologists have investigated has exhibited large-scale individual variation. One benefit that linguistics can obtain from linguists' assertions, even from grossly ignorant assertions, to the effect that linguistics has a subject matter that is biological or psychological in nature is motivation to study variation in language in far greater detail and depth than what linguists have been accustomed to.

Independently of the role that variation will have to play in any linguistics as biology or linguistics as psychology that is to be more than just straight linguistics in a not very convincing disguise, the study of variation has a great deal to contribute to linguistics as linguistics, for example, in the way that it can bring out differences between syntactic constructions that one might not notice if one takes into consideration only a single uniform variety of a language. To illustrate how information about variation can yield valuable perspective on the syntax of familiar types of sentences, and of how the teaching of syntax can give one access to such information, however, I need to make a substantial digression into the way that I conduct my syntax classes.

Since the late 1980s, I have made a point in all my syntax classes of eliciting from the native speakers attending the class acceptability judgments of the examples discussed and tabulating those judgments (I do this for courses on Japanese syntax, Chinese syntax, and Spanish syntax as well as English syntax). I ask not for "absolute" judgments of the acceptability of an example, but for judgments of its acceptability relative to a particular meaning and to whatever contextual factors I think may be relevant, such as who is speaking to whom and what they take as shared knowledge, and I ask for responses not in terms of a 2-way distinction ("good" vs. "bad") but a 4-way distinction, with responses that I call "perfect", "pretty good", "pretty bad", and "horrible". I use 4 grades of acceptability because the contrasts that I need to bring out often involve examples that my respondents do not rate as unqualifiedly good or as totally excluded from their language. Four is the number of grades of acceptability that, in my experience, generally allows my respondents to draw the distinctions that they perceive, without pushing them beyond the number of distinctions that they can draw fairly consistently.

It is essential that more than two degrees of acceptability be provided for, since only then is there even a logical possibility of a **bimodal distribution** of the responses. A bimodal distribution is a statistical distribution in which there are two peaks, and there can't be two peaks unless the responses providing the two peaks are separated by one or more other responses that provide a trough. A bimodal distribution of judgments of the acceptability of a given example can yield a strong case that that example has a different status for some respondents than it does for others. For example, the 11 native speakers present in my "Syntax II" course in winter 1991 gave the following bimodally distributed judgments to one of the examples that was taken up in a discussion of Postal's (1969) "anaphoric island" principle, which excludes anaphoric relations between a pronoun and a syntactic or semantic part of a word:

(1) OK ??? *

4 0 6 1 I won't answer his letter, since it doesn't require one. (one = "an answer")

The number of responses here is too small to allow one build much of a case, but if a group of 50 respondents gave responses in similar proportions (say, 18-1-26-5), one would have good reason to conclude that those responding ?? or * observed a restriction that those responding OK did not. By contrast, if the respondents were only allowed to rate the example as "good" or "bad", then no matter how many of them gave the one response and how many the other, they might all be reacting the same way to the example but just

observing different thresholds of how good an example has to be before they will call it "good".²

Now the illustration that this digression is leading up to. Chomsky (1964:69-70) and Katz and Postal (1964) argued for an underlying parallelism between interrogative and indefinite pronouns, on the grounds that they share a number of features of external syntax such as the possibility of hosting restrictive relative clauses, and subsequently transformational grammarians have occasionally cited as "grammatical" pairs of sentences such as (2a-b):³

- (2) a. I haven't received replies from anyone that I sent invitations to.
 b. Who that you sent invitations to have you received replies from?

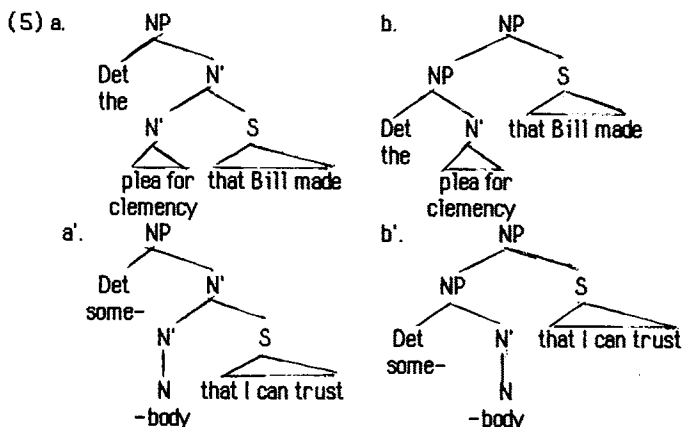
However, while there is virtually unanimous total acceptance of the indefinite examples such as (2a), there is enormous variability in acceptability judgments given to examples with an interrogative pronoun as host such as (2b):⁴

- (3) OK ?? ? *
 16 0 0 0 a. I want to be with somebody that I can trust.
 6 7 2 1 b. Who that you know is likely to enter the contest?

Moreover, while indefinite pronouns allow restrictive relatives to exhibit the full range of variant forms that they generally allow, most of the variant forms are of very low acceptability when combined with an interrogative pronoun, even for speakers who rate combinations with a prototypic relative, as in (3b), perfect. For example, with some exceptions such as the generally accepted *where in London* (4a), reduced relatives are of low acceptability when combined with an interrogative pronoun, though fine with an indefinite pronoun (4b-c'), indefinites but not interrogatives allow the relative clause to take an infinitival form (4d-d'), and, as Jindrich Toman (p.c.) has called to my attention, indefinite pronouns but not interrogatives allow pied piping within the relative clause (4e-e'')

- (4) a. Where in London can you buy Burmese spices?
 b. 15 1 0 0 You should cast someone tall as Hamlet.
 b'. 0 3 6 7 Who tall can we get to play Hamlet?
 c. 11 4 0 0 Try something odd as a value of *x*.
 c'. 0 3 5 6 What odd have you tried as a value of *x*?
 d. Something for you to amuse the children with is in this package.
 d'. *What for us to amuse the children with do you think they've brought?
 e. Someone that you sent an invitation to called to say he can't come.
 e'. Someone to whom you sent an invitation called to say he can't come.
 e". *Who that you sent an invitation to do you think will come?
 e''' *Who to whom you sent an invitation do you think will come?

These facts shed light on the controversy as to what it is that restrictive relative clauses modify — is the host an N' — the constituent consisting of a noun and its complements but not the determiner — as in (5a), or is it a NP, as in (5b)? The possibility of combining restrictive clauses with indefinite pronouns has sometimes led linguists to conclude that the host of a restrictive relative cannot be an N' (5a') and presumably must be a NP (5b'). The argument in question has three relevant premises, two of which I accept and one of which I reject: I accept the claims that an indefinite pronoun such as *someone* makes up a whole NP (since, for example, *someone* can't be combined with a Determiner),⁵ and that it makes up a single word; however, I reject the

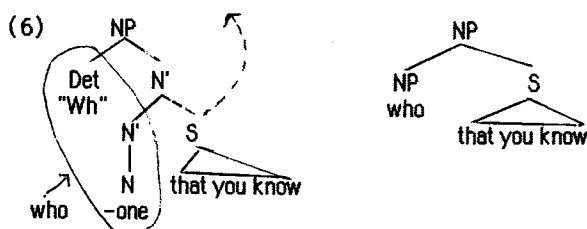


assumption that syntax respects word boundaries and thus that structures such as (5a') in which parts of a word are modified by something outside of the word must be excluded. It is of course only in virtue of that premise that one can rule out of consideration an analysis of examples like (3a) in which the relative clause modifies not the whole word *somebody* but only its constituent *-body*.

There are in fact languages in which syntactic relations between items internal to and external to a word are extremely common, as demonstrated respectively by Sadock 1980 and Sugioka 1984 for Greenlandic Eskimo and Japanese. The differences between indefinite and interrogative pronouns noted above in fact provide grounds for rejecting the assumption that syntax respects word boundaries and for taking the relative clause in examples like (3a) to modify not the whole indefinite pronoun but only the "noun part" of that complex word. The relevant difference between interrogative and indefinite pronouns that I hold to be responsible for the differences noted in (3)–(5) is that indefinite pronouns are morphologically transparent, splitting into a clear determiner and a clear noun (*someone, anything, everywhere, ...*), whereas interrogative pronouns in English are morphologically opaque: *who* or *what* doesn't split into a morphological segment that has any morphological status as a determiner and another one that has any morphological status as a noun. If the normal hosts of restrictive relative clauses were not N's but NPs, as Chomsky (1981) and others have claimed, there would be no relevant difference between interrogative and indefinite pronouns that could be held responsible for the differences noted above, since indefinite pronouns and interrogative pronouns both are NPs and have meanings with which the meanings of restrictive relatives can be combined coherently. But if the normal host of a restrictive relative is an N', indefinite pronouns such as *someone* have a surface form that provides a host for a restrictive relative, while interrogative pronouns such as *who* do not.

But why then aren't the syntactic differences between interrogative and indefinite pronouns bigger than those noted above? In particular, why is there such great variation in the acceptability of examples like (3b), instead of just as unanimous a rejection of it as there is a unanimous acceptance of (3a)? And why do those who accept examples like (3b) generally reject corresponding examples with variant forms of the relative clause, as in (4)? I argued in McCawley 1992a that the speakers of English who accept (3b) have developed a *patch*, in the sense of Jerry Morgan 1972, that is, an ad hoc amendment to their mental grammars that provides them with a way of saying something that, in a sense, they ought to be able to say, but which their mental grammar does not provide a surface form for. The patch here consists of shifting up the tree a restrictive clause that

modifies the implicit N' in the interrogative, so that its surface host is not the N' that the morphology wipes out but the whole NP:



However, the patch covers only the most prototypic forms of the relative clause, i.e. it stretches the grammar as little as is needed to render sayable a class of otherwise unsayable things that speakers of English have reason to want to say and thus does not automatically cover the variant forms in (4). Note that this argument about the status of (3b) requires that one go beyond the facts about the speakers who accept (3b): it is the patterns of variation in the relevant examples that provide the argument for a patch.⁶

Generative linguists often, and with good reason, raise the important psychological question of how children can acquire the knowledge that linguists' descriptions of a given language impute to speakers of that language. Unfortunately, the importance of this question is not matched by the seriousness of the attempts to answer it, which have rarely been more than attempts to codify the wishful thinking of linguists who would just as soon study language acquisition from a safe distance, as when the once popular idea of an "evaluation measure" was hypothesized to be a part of an innate "language acquisition device" that enabled children to choose among alternative grammars the way that linguists did, or at least, thought they did. A particularly common context in which language acquisition is mentioned is polemics in which a linguist (often one whose direct or even indirect acquaintance with the linguistic and cognitive capacities of children is virtually nil) argues against such-and-such syntactic analysis on the grounds that children could not learn it. Such claims are generally on the same intellectual level as the disparaging remarks made by colonials about the mental abilities of the aborigines. One can't draw inferences about what children can't learn unless one has reasonable familiarity with what children can learn and/or of how children learn things.

A common premise in arguments to the effect that children can't learn such-and-such is the popular dogma that "negative information" (information that the language doesn't allow something or other) plays no role in language acquisition. I do not take that dogma very seriously, because so little is known about what information children avail themselves of in acquiring a language and how they extract that information from their environments that the notion of "positive information" (information that the language **does** allow something or other) is itself highly problematic. The question of whether negative information plays a role in language acquisition should not be confused (as it often is) with the question of whether corrections by adults play a role in language acquisition. Corrections are intended to provide both positive and negative information (the child is being told to say one thing and not to say another thing), and the claim that corrections are ineffective is no more an indictment of negative information than of positive information.⁷ Corrections are only one possible source of negative information (unfulfilled expectations are another), and linguists have made so little attempt to tabulate possible sources of negative information and establish whether they play a role in language acquisition that the dogma that children do not use negative information is supported only by an argument from ignorance.

Even without detailed knowledge about what information children use in acquiring their native language and about how they extract that information from their environments, it is of some value for a proponent of a particular linguistic analysis to ask whether there is a plausible scenario for how children might acquire the rules, dictionary entries, and what not that figure in that analysis. To raise that question, however, one needs to draw some tentative conclusions about what the child would already have learned when the possibility of learning some rule or other arises: what a child might be able to learn at a given point in its development depends heavily on what it already knows.⁸ I will give two illustrations of this point, one relating to very early events in the acquisition of the syntax of English auxiliary verbs and one relating to a much later event, both suggesting how an attempt to construct a scenario for language acquisition can provide a rationale for specific syntactic analyses. First, some conjectures that I regard as highly plausible:

i. Morphology provides a sufficient condition (I emphasize: a sufficient, not a necessary condition) for a child to assign words to word classes — for example, as soon as a child recognizes that a word bears inflections for categories for which verbs are inflected, he identifies it as a verb, even if he as yet knows nothing about its syntax or even its meaning. Thus, once a child has caught on to the fact that *are* in *The boys are playing too rough* is a present tense form, it will belong to the same category as *play* and *eat* for him, even if he doesn't yet understand the sentence.

ii. Among the things that a child learns in the course of language acquisition is an inventory of the **surface** syntactic configurations that the language allows. I hold that such an inventory of configurations is part of an adult's linguistic competence in view of, for example, the fact that languages commonly exploit particular surface configurations for multiple purposes, for example, the eight different syntactic constructions that Lees (1960) identified in which there is an AP that consists of an A and an infinitive VP with *to*. In particular, English is sufficiently rich in VPs consisting of a V and a dependent nonfinite VP (as in *Try to help him* and *He kept hitting me*) that a child would add the configuration [vp V VP] to his list at a relatively early point in his acquisition of English syntax.

iii. Children exploit the surface syntactic configurations that they have already learned, assigning surface structures in terms of these configurations to hitherto unanalyzed Ss unless they are forced to go beyond what is already in their evolving list of surface configurations.

These three conjectures have the interesting implication that a child will interpret auxiliary verbs as fitting into the [vp V VP] configuration as soon as he identifies them as verbs, and that he will have thus reduced the problem of learning their syntax to something manageable: he will have a specific surface structure for sentences involving auxiliary verbs (it doesn't matter if there's more than one — the configuration can be iterated), and once he learns what contribution each auxiliary verb makes to the meanings of sentences in which it occurs, it will be a fairly trivial matter for him to assimilate various auxiliary verbs to relations between syntactic form and semantic structure that he already knows or (in the case of passive *be*) to learn a new rule relating the surface structures of sentences like *They were told lies by that man* to semantic structures in which the verb (here, *tell*) combines with the same sorts of semantic entities that it otherwise combines with. According to this scenario for language acquisition, then, a child will acquire the structures that figure in an analysis of auxiliaries as main verbs (Ross 1969, McCawley 1971) before it has acquired any of the syntax that is specific to auxiliary verbs.⁹

What about the once widely discussed restrictions on the order of English auxiliary verbs, as built into Chomsky's celebrated formula Tense (Modal) (*have -en*) (*be -ing*)? If language acquisition has proceeded according to the above sketch, then the relevant

question is: do children learn any special restrictions on how auxiliary Vs can combine with each other, or are the restrictions on cooccurrence of auxiliary Vs simply consequences of knowledge that they acquire about each individual auxiliary V, such as the knowledge that the complement of progressive *be* has to denote a process or activity rather than a state? The answer may in fact be: both. The restriction on progressive *be* just noted is violated by most sentences in which progressive *be* precedes perfect *have*, such as (7a), which is thus excluded without any need for a restriction on sequences of auxiliary verbs; however, there is a type of sentence in which progressive *be* precedes perfect *have* without violating the semantic restriction, namely that in which the perfect *have* is combined with an iterative construction, as in (7b):

- (7) a. 0 0 6 9 John is having worked hard.
 b. 4 9 2 0 Whenever I see John, he's always having just taken a trip to Florida.

What is of interest here is not just the huge difference in the acceptability judgments of these sentences, neither of which conforms to the Chomsky formula, but the less than full acceptance of (7b) by most of the respondents; this suggests that many of the respondents have acquired at least a weak restriction against progressive *be* preceding perfect *have* even in cases where the combination is semantically well-formed. Something like the Chomsky formula may then have some sort of psychological reality, but a very different status from what Chomsky 1957 attributed to it: it would be largely redundant, it would be part of only some speakers' knowledge, and its violations would reduce acceptability only slightly.

Let us turn to another aspect of the cooccurrence of auxiliary verbs. In my analysis of English auxiliary verbs, I posit a rule which, if children in fact learn it, they couldn't learn until they had already learned a great deal more, including the restrictions on the cooccurrence of various time adverbials with tenses and auxiliary verbs. The rule in question is one that deletes one of two occurrences of auxiliary *have*, which I need to posit to account for the possibility of getting a single *have* in non-finite counterparts of past perfects:

- (8) a. John had/*has already left when Mary arrived.
 b. John is believed to have already left when Mary arrived.
 b'. *John is believed to have already had left when Mary arrived.

Since my analysis posits a tense-replacement rule whereby a past tense is replaced by *have* in a nonfinite context, (8b) will have two occurrences of *have* in an intermediate stage in its derivation (one from the Past, in addition to the one that is already there), and the *have*-deletion rule is needed to insure that only one *have* will appear in the surface form of such sentences.

How could a child acquire the *have*-deletion rule? The one obvious way is by hearing a sentence like (8b), noting the discrepancy between the single *have* in its surface form and the two *have*'s that the time adverbials in the infinitive complement demand, and converting the perceived discrepancy into a rule that eliminates the discrepancy by deleting one of the *have*'s.¹⁰

What I have just described is a fantasy: I have no idea what events have actually taken place in the developmental histories of the many speakers of English who find (8b) acceptable and (8b') unacceptable. However, one detail of the fantasy provides an interesting link to reality. According to the above scenario, learning the *have*-deletion rule would be a consequence of the child noticing a discrepancy between sentences such as (8b) that he hears and the form that they ought to have according to the rules that he has learned so far. But sentences like (8b), in which a combination of time adverbials that

requires a past perfect appears in an embedded nonfinite complement, are fairly rare, and a person might well reach adulthood without ever having heard or read such a sentence or without having realized the syntactic significance of the rare instances that he had encountered. Accordingly, if acquisition of the *have*-deletion rule follows the above scenario, we should expect considerable individual variation in whether a person acquires the rule, that is, there should be many persons who have not acquired the rule and for whom the acceptability of (8b-b') is reversed. There in fact is such individual variation, as I learned by reading Schachter (1984:166) and finding acceptability judgments that were the reverse of what I was used to:¹¹

- (9) a. ?John seems to have had already eaten.
b. *John seems to have already eaten when you saw him.

I have not yet investigated the variation in the acceptability of examples like (8b-b') in much detail, but for what it is worth, I give in (10) the judgments given by the 17 native speakers of English in my winter 1993 "Syntax II" course, which shows that a fair number of the respondents find a double *have* reasonably normal sounding, though considerably less so when the two *have*'s are adjacent:¹²

- (10) a. 14 3 0 0 Mary seems to have already left when John called.
b. 1 7 9 0 Mary seems to have had already left when John called.
c. 2 11 3 1 Mary seems to have already had left when John called.

In any event, the scenario that I constructed for the acquisition of the *have*-deletion rule has paid off in identifying a locus for individual variation where there in fact is variation of the sort that the scenario would lead one to expect.

I now return to linguistics as biology. If one wishes to claim that human anatomy, especially neuroanatomy, makes it possible for a human being to acquire a language and sharply constrains the range of languages that a human being can acquire, one should expect the relevant anatomy to be subject to the same sort of genetically determined individual variation that is found in the fine details of all anatomical structures. Fingerprints are largely determined by one's genetics, and they vary so much from one individual to another that it is practical to use them to identify individuals; Williams (1956) provides numerous examples of anatomical and biochemical individual differences among human beings that are largely the result of genetic differences, such as differences in the size, capacity, shape, and location of the stomach. David Hull's (1987:14) statement that "One reason for anthropologists searching so assiduously for cultural universals is the mistaken belief that some connection exists between universality and innateness" applies to universals of language as well as of culture. Biological factors can be responsible for variation in language as well as for universal features of language, and universality in language need not be due solely to biological factors. I emphasize that I am not concerned with individual variation in features that define linguistic pathologies such as the "dysphasia" discussed in Gopnik and Crago (1991), in which a dominant gene apparently causes those who possess it to have serious impairments in their ability to use and respond correctly to inflectional morphology, but rather with genetically determined variation within the range of "normal" language, i.e. linguistic analogs to such anatomical features as fingerprints and eye and hair pigmentation.¹³

With regard to the point that universals of language need not reflect shared biology, I note an interesting hypothesis about the relation between human biology and the human capacity to acquire languages that is implicit in Suzette Haden Elgin's science-fiction novel *Native Tongue*. The novel is set on Earth in a future century in which a hereditary

guild of linguists are trained in the acquisition of foreign languages from early childhood and eventually serve as interpreters between Earth languages and languages of extraterrestrial aliens; however, they are able to acquire only languages of 'humanoid' aliens and suffer severe mental damage if they attempt to acquire a language of a non-humanoid species. The notion 'humanoid' is of course a functional rather than a genetic notion: the humanoid species would be those whose anatomies not only give them a vaguely human appearance but cause them to engage in human-like activities and to have languages that reflect their ways of behaving and of perceiving the world around them, though genetically they would be more different from human beings than we are from flatworms. Humanoids would presumably walk erect on the surface of their world, rather than floating in a liquid, and would thus share those aspects of human cognition that Mark Johnson, in *The Body in the Mind*, takes to be consequences of the orientation that we derive from our upright posture, the force of gravity, and fact that our eyes face in the direction in which we walk. The genetically determined basis for language acquisition that Elgin posits in her novel is thus something that is effective for acquiring a range of languages that could be defined only in functional and not in genetic terms and would include languages that could not evolve in human societies.

I bring up Elgin's novel for two reasons. First, to suggest that for all we know, the biology of language acquisition by human children may work the way that Elgin implicitly hypothesizes that it does, being applicable not only to human languages but to languages of humanoid aliens, just as long as their *modus vivendi* is close enough to those of human beings; and second, to suggest that the biological mechanisms specific to language acquisition need not reflect very closely the biological constraints on what languages can evolve in human societies. One of the most important of the many valuable perspectives on spoken language that the study of sign languages has yielded is a basis for separating those aspects of phonology that are due to the anatomy and physiology of the vocal tract, and of the organs of hearing, from those aspects that reflect organizational features of phonology that are independent of the medium of expression, such as the organization of both vocal speech and sign into syllables (argued by Wilbur 1990 to have an onset-nucleus-coda structure like spoken-language syllables), and the organization of syllables into metrical units. In view of the fact that the vast majority of deaf signers are the children of hearing non-signers, one can safely infer that nothing specific to signing is part of the genetic endowment of human beings,¹⁴ and that the genesis of sign languages involved only cultural and not biological evolution — the development, through trial and error, of conventions as to what hand shapes, positions, and movements could be organized into syllabic units that could be produced, perceived, and learned easily, quickly, and reliably enough to serve as an efficient medium for face-to-face communication.

If this conjecture is correct, it implies that the units that figure in a language need not all be inherently linguistic in nature, i.e. that while a human language may have to conform to some general scheme of organization, languages can coopt for linguistic purposes anything that their motor and sensory apparatus can deal efficiently with within that general organizational scheme.

How could one test Chomsky's claim that human language is largely shaped by biology? One cannot argue for that conclusion merely by pointing to masses of putative language universals, since genetics yields diversity as well as uniformity, and ecology as well as genetics yields uniformity. Adherents of the position that human languages are the way they are for biological reasons should worry about the possibility that human language might be **more** uniform than it should be if there is as much biology involved in it as Chomsky suggests. To evaluate that position, one needs to investigate both the sources of the uniformities in language and the sources of the diversity.¹⁵

The most promising way to provide a solid footing for claims of biological

determination of human language may well be to search for genetically determined variation in language. The most obvious research program aimed at finding such variation would consist of three parts: (1) compilation of a list of dimensions of individual variation in some particular language, (2) elimination from that list of the items for which a plausible non-genetic account of the variation can be constructed, and (3) testing of the items remaining after part 2 of the program to see whether they show the patterns of distribution within families that are typical of genetic determination. In part 1 of the program, one would assemble a comprehensive list of loci of individual variation in a given language, excluding those features that are known to distinguish the dialects of particular regions and social groups and which are presumably acquired in the course of growing up in a community whose dialect has those features. Any sort of linguistic variation is fair game for inclusion in this list, and no significance should be attached to the fact that I illustrate variation mainly in terms of acceptability judgments of sentences: that is just the area of variation that I know the most about. There are quite a lot of possible sources of non-dialectal individual variation in a language, some of them biological and some not, as presented in the following undoubtedly highly incomplete list:

- i. variation in experience, resulting in variation in what is learned. (particularly: cases where the 'crucial data' are something relatively uncommon)
 - a. in linguistic experience, e.g. in whether one hears particular kinds of 'crucial data' and notices the features relevant to learning something or other.
 - b. in feedback that one receives from those with whom he interacts.
 - c. ...
- ii. genetic variation
 - a. in the 'schematic' form for a 'grammar'. [should result in covariation between the languages, in the case of early bilinguals]
 - b. in genetically determined learning mechanisms, not necessarily restricted to acquisition of a language (should be manifested in variation even when the 'crucial data' aren't exotic, and in covariation with learning in other domains; could be manifested in differences in paths of acquisition, e.g. differences in what is unmarked, or differences in the division of labor between linguistic and non-linguistic learning mechanisms).
 - c. in the relevant perceptual organs, resulting in variation in what is noticed.
 - d. in the organs of speech production, resulting in individual differences in which feature values are unmarked from the point of view of effort in speech production. (There is in fact considerable individual variation in the anatomy of the tongue.)
 - e. ...

In part 2 of the program, one would eliminate from one's list those points of variation for which an explanation of the variation in terms of one of the factors listed in (i) is plausible; for example, variation in the acceptability of *have already had* (8-9) would be crossed off the list, since that can plausibly be accounted for in terms of random variation in children's linguistic experience.¹⁶ Three examples of the sort of variation that might remain after part 2 of the program are given in (11):

- (11) a. *Bob is taller than Carol by 2" more than Alice is taller than Ted.
 - a'. *Bob is taller than Carol by 2" more than Alice is taller than Ted by.
 - b. *Bob may be being blackmailed by his ex-wife.
 - b'. Bob is being blackmailed by his ex-wife.
 - c. *How many people do you think that will be at the party?
 - c'. How many people do you think will be at the party?

Many speakers of English find one of (11a-a') pretty good to perfect and the other one horrible, but they differ with regard to **which** one they like and which one they dislike. Double instances of the **allomorph** *ʒe*, as in (11b), are rejected by many speakers of English while accepted by many others, though double instances of the **morpheme** in question, as in (11b'), are otherwise unanimously accepted. Sobin (1987) documents large-scale individual variation in the acceptability of subject gaps after *that* (11c).

Part 3 of the program consists in studying the distributions within families of the features that remain under consideration after part 2. One would need to find consultants who have living, accessible parents, siblings, and children, and determine for each of the linguistic characteristics whether it shows a pattern that corresponds to a known kind of genetic determination. For example, if a phenotypic distinction corresponds to a single gene position with dominant and recessive alleles, offspring of parents both showing the recessive characteristic will always show the recessive characteristic; offspring of parents, one with the dominant characteristic and one with the recessive either all will show the dominant characteristic or will have a 50% probability of showing it, depending on whether the parent showing the dominant characteristic carries the recessive as well as the dominant gene.

Actually, this sort of study will need to be quite a bit more complicated than I've described, for at least two reasons. First, one's consultants' statements as to who is the father of whom will not always be correct. Diamond (1992:85-7) notes that a serological study carried out at an American hospital in the 1940s yielded the unexpected result that over 10% of the babies in the study could not have been the children of their ostensible fathers. To do part 3 of the program right, one would have to either blood-type one's consultants or do some very fancy statistics. (Mendel, by contrast, had a much easier time of it, since he didn't have to worry that his female pea plants might be cheating on the male pea plants that he crossed them with.) The second, and for a linguist, more interesting reason why part 3 of the program would require considerably more thought and detailed analysis than what went into Mendel's pea experiments is that many genetic individual differences in language may be manifested not in what language one acquires but in markedness relations, and concomitantly, the route by which one acquires what in relevant respects may be exactly the same linguistic system that other members of one's community acquire.¹⁷ Items (1ic-d) in the list of possible genetic influences on language are particularly relevant to individual differences that would be manifested largely in markedness relations. (I say "largely", because markedness determines what linguistic forms count as "defaults"; in cases such as (8-9), where I have conjectured that children would acquire a particular rule only on the basis of relatively rare kinds of linguistic experience, perhaps the form that for some children is a marked form that has to be learned is for other children an unmarked default that need not be learned. The difference in markedness would then affect the distribution of the acceptability judgments, but not in the relatively neat way that would correspond to a single gene either guaranteeing or precluding one's acquiring a particular detail of language.) Thus, it would be important in executing part 3 of this program for the investigator give his consultants tasks that would yield information about markedness relations among the items that are at issue.

This vast project could conceivably yield valuable perspective as to what roles brain anatomy, anatomy of the organs of speech production and perception, functional features that affect the viability of particular linguistic systems, and the developmental histories of individual speakers of a language have in determining what linguistic systems each individual acquires. Even if it yielded no clear cases of genetically determined linguistic characteristics, it would still be of value for identifying cases of variation whose source was unknown but which was not the result of at least the more straightforward kinds of genetic determination. By studying those areas of variation, one might make valuable additions to (i) in the above list of sources of variation. Note, though, that the sort of

study that I sketch here would have to rely on massive amounts of linguistics as linguistics: studies of the sorts of syntactic, morphological, phonological, and semantic phenomena that linguists have been studying all along, but with an attention to variation and a commitment to recording and tabulating the variation that has largely been lacking in linguistics.

Finally, I wish to emphasize that a commitment to providing biological substance to linguistic theories should lead linguists to have serious doubts about the common policy of linguists of treating human language as sharply separated from all other areas of human cognition. Virtually all biological structures have multiple functions, and evolution typically proceeds by steps in which novel possibilities of existing structures are exploited and previously secondary functions increase greatly in importance. This point is easy to illustrate in the domain of speech production, where all of the relevant organs retain functions that they had had in digestion and respiration long before the development of speech among human beings. There may very well be anatomical structures in the human brain that are specifically dedicated to the acquisition or to the use of language, but those structures are parts of the human body and not parasites or symbiotes whose host is a human body. In both the acquisition and the use of language, there is a division of labor between many parts of human anatomy, some of which may have mainly linguistic functions, but most of which do not. As I have argued elsewhere (McCawley 1983a), it is absurd to suppose that the various neurological mechanisms that are involved in the learning of things other than language turn themselves off when language is being acquired. I have suggested that the neuroanatomy that is specific to language acquisition could very well be a mechanism that harnesses more general learning mechanisms to do linguistically useful work, by directing their attention to types of information that are specifically relevant to language acquisition; for example, the neurological basis for a universal system of syntactic categories, perhaps a version of X-bar syntactic categories, might be a mechanism that directs the attention of a more general mechanism for category formation to a small list of factors that are specifically relevant to syntax.

The claim that linguistic structure is largely determined by biology has played virtually no role in syntactic and semantic research done within Chomsky's "Government and binding" approach: the innovations that linguists operating within that framework have proposed have not come about through their refining their biological claims or developing linguistic hypotheses that have biological rationales but rather from considering the same sorts of linguistic facts that are of concern in many other schools of linguistics and choosing among alternative analyses of those facts on the basis of esthetic considerations that have no biological rationale and in some cases conflict with what biological considerations would lead one to expect, for example, an abhorrence of redundancy in analyses. In GB linguistic practise, biology has generally served only as a term in arguments from ignorance: we can't imagine how children could learn such-and-such feature of their language, so it must be in their genes.¹⁸ As Tom Bever (unpublished paper presented at 1981 CLS meeting) has pointed out, such arguments can be turned in any direction one chooses: we can't imagine how a genetic basis for such-and-such feature of languages could have evolved, so it must be learned somehow or other (or so it must be a consequence of ecological factors or ...). More generally, arguments from ignorance can be turned in the direction of any aspect of one's ignorance.

Current invocations of biology in linguistics are largely hot air: they hold human biology to be responsible for the range of forms that human languages can take, but they stop far short of raising even vague conjectures as to how biological determination of language works. If linguists are going to take their talk about biology beyond the realm of mere hot air, they need to give their talk some biological substance, by attempting to form hypotheses as to **what** biological factors have **what** sort of influence on language, and to find implications of those hypotheses that could conceivably be tested, and by finding ways

to exploit their biological hypotheses in their linguistics.¹⁹

NOTES

1. Under "OK" here is given the number of respondents who rated the example as "Perfect", under "?" the number who rated it as "Pretty good", under "???" the number who rated it as "Pretty bad", and under "*" the number who rated it as "Horrible". The % that appears in front of such examples as (4e) means 'variation in acceptability'.

2. There are of course other possibilities: perhaps all 11 observe the same restriction but only 7 of them noticed that the example violated the restriction; or perhaps the 4 who accepted (1) interpreted it differently than did the other 7. Such differences can be controlled for retrospectively by asking those who gave the example low ratings what they think is wrong with it and then asking those who accepted it whether the considerations brought up by the others would make any difference to their responses.

An important problem that needs to be addressed before I can treat these bimodal distributions as significant is: how can I justify equating one respondent's '?' with that of another respondent? I may have unwittingly solved that problem by the manner in which I have elicited judgments in my classes, calling for a show of hands of those who rate the given example "perfect", then those who rate it "pretty good", etc.: I conjecture that after a few rounds of giving judgments in this way, the members of the class have developed a tacit convention as to what degree of unacceptability is to count as "horrible", what as "pretty bad", etc. In that case, though, I would not be justified in pooling the responses elicited from different classes, since different classes might have developed different tacit conventions.

3. Chomsky (1964:69) actually cited only examples in which the relative clause is hosted by an interrogative was extraposed (i-i'), not examples in which it directly follows its host, as in (ii-ii'), and makes no explicit mention of the role of extraposition in his examples:

- i. Who do you know who has a scar? (cf. You know someone who has a scar.)
- i'. Who do I know who was expelled? (cf. I know someone who was expelled.)
- ii. Who who has a scar do you know?
- ii'. Who who was expelled do I know?

The earliest citation that I have found (I am sure there must be earlier ones) of non-extraposed relative clauses with an interrogative host is Lakoff's (1968:309) citation of (iii-iii'), taken from unpublished work by Postal, as evidence against Ross's obligatory cyclic pronominalization transformation:

- iii. Who who is from her hometown does Sam think that Mary will marry?
- iii'. Who who is from Mary's hometown does Sam think that she will marry?

Lakoff states that there is individual variation in the acceptability of these examples, but describes it as variation in the conditions under which extraposition of relative clauses is obligatory: "Although Extraposition of relative clauses would be obligatory in [iii] for some speakers, there are many speakers for whom [iii], with its unextraposed relative clause, is grammatical". An account in terms of obligatoriness of extraposition of relative clauses leaves it a mystery why, for the speakers in question, obligatoriness of extraposition of the relative clause depends on whether it is combined with an interrogative pronoun, or with an indefinite pronoun, or with an interrogative expression of the form *what/which N*:

- iv. Someone who is from Mary's hometown is expected to marry her.

iv'. Which person who is from Mary's hometown does Sam think that she will marry?

4. The numbers of responses given here and below come from the native speakers of English in my "Syntax II" course, winter 1991 or winter 1992, unless otherwise specified.

5. Expressions such as *that somebody*, in which *somebody* is combined with a demonstrative, are in fact quite common, but are not directly relevant to the category status of "ordinary" uses of indefinite pronouns, since the word then is being used metalinguistically: it alludes to the referent of a preceding use of *somebody*.

I have had surprisingly little success in finding a published instance of the argument to which I allude here, though the conclusion that restrictive relatives modify NPs is accepted in a very diverse body of literature (including works by me before I knew better and by Chomsky after he knew better).

6. Why, then, do interrogative heads allow extraposed restrictive relatives, as in the examples from Chomsky 1964 cited in note 3? I do not yet have an answer that I am happy with, but am sure that part of the answer lies in the fact that it is less clear what an extraposed relative modifies than what its non-extraposed counterpart modifies.

7. Morgan (1992) argues that the negative aspect of a correction is often ineffective because the child will fail to recognize that it is a correction and may even misinterpret it as a reinforcement of what he has just said.

8. This is the biggest of my many reasons for regarding as pernicious Chomsky's "idealization" of treating language acquisition as instantaneous, that is, of concerning oneself only with the relationship between the total set of "data" that a child encounters and the eventual adult grammar that he develops: Chomsky idealizes away the very subject matter of a theory of language acquisition.

9. There is one important respect in which this statement may be wrong. Constructions involving inversion, especially questions, in which an auxiliary verb precedes the subject, may play an important role in the child's identification of auxiliary verbs as verbs, since they are the principal class of sentences in which a child would hear auxiliary verbs in a full (and thus perceptually salient) form rather than a contracted or reduced form. The fact that children commonly produce non-inverted sentences with full forms of auxiliary verbs before they produce them with contracted or reduced forms may reflect the following sequence of events: (i) a child learns an auxiliary verb in an inverted construction and identifies it as a V; (ii) it identifies the corresponding contracted and reduced forms in non-inverted clauses with the V that it now knows; (iii) it assimilates that V to the already learned [yp V VP] configuration; (iv) it learns the contracted and reduced forms of that V. In this scenario, the child then probably would have learned some syntax specific to auxiliary verbs, namely the [_S V S] configuration that would be acquired as a concomitant of (i).

10. Under this scenario, the child acquires the *have*-deletion rule without any reliance on negative information, such as the unacceptability of (7b'). Lightfoot (1990) states incorrectly that the rule could be learned only via access to negative information, which he takes as implying that it is unlearnable.

11. Schachter does not actually cite (8b) but states that *John seems to have already eaten* excludes an interpretation an interpretation with an embedded past perfect, which I take as implying that he would reject examples such as (8b) in which other material forces such an interpretation.

12. The fact that some respondents find both *have already* and *have already had* pretty good to perfect in nonfinite past perfects suggests that for them *have*-deletion is optional. If the scenario sketched above is to be developed into a real theory of language acquisition, it will need to be amended so as to provide for the acquisition both of optional

and of obligatory rules. One possibility is that transformations are initially learned as obligatory but are made optional when the learner encounters instances of their non-application (e.g. perhaps both of (7b-b')) are accepted by those whose linguistic development has included exposure to examples of both varieties).

13. In the only place that I know of (letter to the editor, *New York Review of Books*, vol. 38 (1991), no. 21) where Chomsky explicitly discusses genetically determined variation in language, as opposed to merely mentioning it only to dismiss it as supposedly irrelevant, he takes up only genetically determined language pathologies.

14. My one hesitation in drawing this inference is that I am in no position to reject *tout court* Gordon Hewes' (1973) hypothesis that the earliest human languages were not spoken languages but sign languages. For a detailed discussion of the respects in which the acquisition of sign languages parallels that of spoken languages, see Petitto 1993.

15. The sort of investigation that I allude to here has much in common conceptually with Nichols' (1992) study of the different geographical distributions of linguistic features that result from common ancestry of languages, from typological factors, and from several different kinds of contact among languages.

16. Some of the items eliminated in this stage of the program might nonetheless be influenced by genetically determined factors. For example, genetically determined factors might influence the likelihood that a child would **notice** the discrepancy between the adverbials and the single *have* in examples like (7b) that it had heard.

17. Differences in paths of language acquisition are discussed in Landahl, Mishra, and Gould 1987. Trudgill (1981) gives a detailed example of persons reaching apparently identical linguistic systems via different routes, in a study of a pair of twins from England, who acquired Australian phonology in the course of a year in Australia but acquired the various Australian features in a very different order.

18. To cite just one of many instances of such arguments: "It seems implausible that all people capable of these distinctions have sufficient confirmatory evidence to establish the principle governing stacking of relatives. Following the line of argument just outlined, it is therefore reasonable to postulate that as a property of universal grammar, biologically necessary, nonrestrictive relatives cannot stack" (Chomsky 1976:66).

19. Chomsky's distinction between "core grammar", which is acquired through the setting of various "parameters", and the "periphery", which is acquired in some other way (though Chomsky does not say what), commits him to a division of labor between different learning mechanisms in language acquisition. The absence of any concrete claims as to how the "periphery" is learned is a serious deficiency in "Government and Binding" linguistics, in view of the importance of the "periphery" in the concrete analyses proposed within Chomsky's "Government and Binding" framework: the "periphery" includes not only ordinary lexical information but details of the special roles that elements play as markers in particular syntactic constructions (e.g. Chomsky (1986:122) takes the dictionary entry of passive *by* to include the information that its object takes over the theta-role of the subject of the verb that it is combined with). The mechanisms involved in acquiring the "periphery" thus are quite powerful (sufficiently much so that it is hard to understand how Chomsky can claim that a passive transformation would be unlearnable — acquiring the dictionary entry for *by* would be tantamount to acquiring the part of a passive transformation that moves a NP from subject position into an adjunct marked by *by*, sufficiently much so as to raise doubts that they could not do the work involved in acquiring "core grammar" and thus to raise doubts that it makes any sense to distinguish between "core grammar" and "periphery").

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RELATIONAL NETWORK LINGUISTICS MEETS NEURAL SCIENCE

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From the time when relational networks were first publicly introduced in 1965 (Note 1), people have occasionally asked whether these networks are intended to have any resemblance to neural networks. Answers given by Lockwood and me and others have been along the lines that the networks have been constructed (or *encatalyzed*, to use Hjelmslev's term) as a means of accounting for the linguistic data and that no information about neural networks was used, at least not consciously, and any resemblance was not planned. Such statements were given support by the fact that neither Lockwood nor I had any particular knowledge of neural networks. Reich has taken a similar position even though he did have such knowledge. In keeping with his intent to base his findings on linguistic evidence, he used such knowledge only to a very limited extent (Reich 1973).

In the intervening years, several revisions to the original formulation of relational network theory have been proposed (not all of which have been properly documented), including an analysis of the lines of the networks into pairs of one-way lines along with a corresponding analysis of the nodes into assemblages of one-way nodes (cf. Christie 1977, Lamb 1980). Also, the original multi-stratal model with meaning at the top has been modified to a model with fewer strata and with meaning, modeled as a conceptual network, seen at the side rather than at the top and thus connectable directly to multiple strata rather than only to the highest.

Another recent development in my intellectual development is that I have started to learn about some of the findings of neural science. As a result, I am now in a position to compare the more recent formulations of relational network theory with recent findings from the neurosciences as summarized in recent neuroscience texts (for example, Kandel, Schwartz, and Jessell 1991).

In this two-part paper, the first and longer part will review the developments leading to the current theory (which continues to develop) as I see it; and the second part will look very briefly at possible correlations with findings from the neural sciences. The first part follows a logical order of steps which is also for the most part the actual chronological order of the steps taken by me during my 35-year research odyssey (thank Heaven for the tenure system!). These steps are named below in bold type, with brief explanations and discussion as appropriate. At the outset it needs to be emphasized that all of steps 1 through 10 are motivated and justified by linguistic evidence, not neurological evidence. It is only after Step 10 that we look at the neurological evidence.

Part 1: Steps to Take in Understanding Language.

For each step, there is a problem to consider and a result of the consideration. The results are numbered to correspond with their respective steps.

Step 1. Problem: What is it that we are trying to understand?

The obvious answers, "Language" or "languages", are not very helpful, because neither linguistics nor any other field has come up with a usable definition of "Language", nor of "languages". There is no way to define the term *language* in such a way that we can enumerate languages or tell one language from another. For example, how many languages are there among the Romance dialects of the Iberian Peninsula, or among those loosely called "Chinese", and what are their boundaries? There are no such boundaries. Nor is it possible to define language in such a way that we can decide whether systems of gestures are or are not included in the scope of language, or whether conceptual systems are part of language rather than being connected to language but separate from it.

Another question: Does the term "language" refer to (1) sentences, utterances, texts; or (2) to the system(s) which is/are capable of producing/understanding such stuff; or (3) to the process(es) by which such producing/understanding is performed; or some two of these; or all three? And so on --- there are further such questions. *Language* is in fact a very vague and multifaceted term and is by no means precise enough to be used as a technical term.

Yet this term is evidently associated with some useful ideas. The position I have arrived at after consideration of the problem may be stated in three parts:

Results of Consideration (Step 1).

1a. There is no such thing as either "a language" or "Language", as a separable or distinguishable object. But it doesn't matter. What we are interested in is the phenomena which lie behind our use of these terms. They should be recognized as non-technical terms since they cannot be given any exact meaning. Such phenomena may be called *linguistic phenomena*.

1b. We must recognize that some of the most important linguistic phenomena are definable only in relationship to actual human beings.

1c. Among these phenomena we may distinguish between (1) LINGUISTIC EXTENSION (the texts, whether spoken, written, or signed; (2) LINGUISTIC SYSTEM (comprising those portions of the cognitive system of a person which are used for producing and understanding texts); and (3) LINGUISTIC OPERATIONS (the activities performed by the linguistic system). While less vague than the term *language*, the term *linguistic extension* is also vague. We may speak of the linguistic extension of a community or that of a single person; the latter should be recognized as more basic in the sense of being less abstract. We may also distinguish between the *actual linguistic extension*, consisting of the texts that have actually been produced and/or understood by a person (or community) during a given period; and the *potential linguistic extension*, consisting of those which a person is capable of producing and/or understanding at a given moment. (The latter is of course more abstract and cannot be directly observed.) Also, *productive linguistic extension* is not the same as the *receptive linguistic extension*, as one might but should not infer from the preceding definitions. Finally, we should note that the traditional notion of separate languages, like English and French in the case of a French-English bilingual, does not apply for any of these versions of linguistic extension. Such a person's linguistic extension includes texts of both languages.

Some similar distinctions may be made among different kinds of linguistic system. The term *linguistic system* without further qualification may be used to refer to the linguistic system of the individual person --- and "individual person" should be taken as meaning any typical real person, not some sort of imaginary "ideal speaker-hearer".

Step 2. Problem: How is the linguistic system organized?

The considerations pertaining to this problem have been heavily discussed in the literature over the years, so we may here go directly to

Results of Consideration (Step 2).

2a. The Linguistic System can only be understood in relationship to the processes of speaking and understanding and learning, etc. (Lamb 1971b, Reich 1973).

2b. The Linguistic system is organized in multiple subsystems or hierarchies (Lockwood 1972). For one version, see Figure 1.

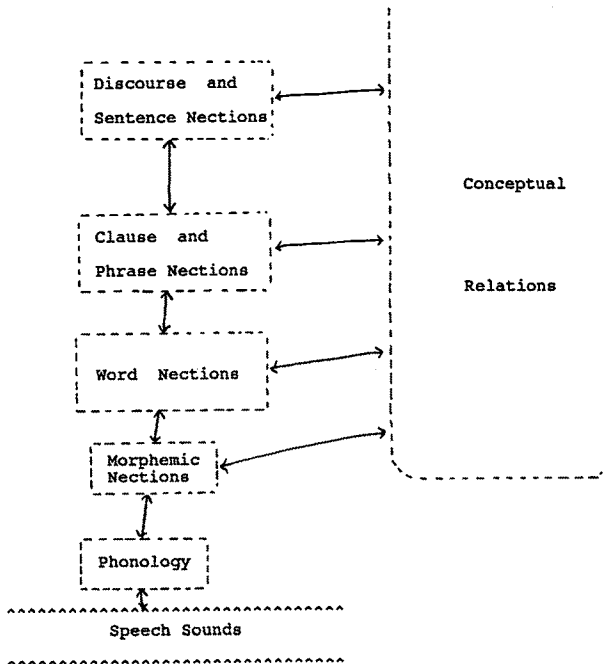


Figure 1. Subsystems of "the Linguistic System".
(For the term *nection*, see below.)

2c. There is no reason to suppose that the linguistic system of a person is just one system, bounded or in one place in the overall cognitive system, nor that parts (subsystems) of it are necessarily exclusively devoted to linguistic functions. Thus the term *linguistic system* is potentially misleading, and the term *collection of linguistic subsystems* would be more accurate, but will not be used here because it is too cumbersome.

2d. The linguistic system of a person is a network of relationships rather than a collection or arrangement of rules and/or symbols and/or other objects (Lamb 1971a, Lockwood 1972; see list of reasons below). See Figure 2 for an example of a small fragment of network structure.

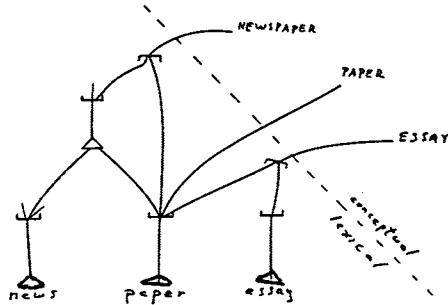


Figure 2. Some Relations Involving the Expression *paper* and Concepts to Which it is Connected, in Broad Notation.

It may be worthwhile here to list a few of the

Reasons for Believing that the Cognitive System is a Network:

1. If we start from the hypothesis that it is made up of objects (such as phonemes and morphemes) and then analyze the relationships of these objects to one another, we find that they are fully accounted for by those relationships. Their hypothetical "objectness" is therefore superfluous (Lamb 1971a).

2. It can't work as a system of rules and symbols, or a system of symbols and "patterns", the only other possibilities that have been proposed. The mind does not have little internal eyes (nor other internal sense organs) to read such symbols nor little internal pencils and pieces of paper (nor other internal motor organs and media) to write and rewrite them with.

3. The relational network model applies well to obvious cases, such as the transmission of activation from the retina to higher levels of the visual perceptual system, from cognitive levels to muscles, etc.

4. The network model helps to account for how children learn their native languages -- including phenomena otherwise mysterious and unexplained, such as children's production of brang as the past tense of bring.

5. The network model helps us to account for (1) unintended puns, (2) slips of the tongue, (3) word associations, and other phenomena involving association.

6. The network model provides an explanation of the phenomenon of regularity of phonological change in historical linguistics, a phenomenon which has never been satisfactorily explained by any other means.

Step 3. Problem: What is the structure of the network?

Again, the considerations have been discussed extensively in the literature over the years, during which time various hypotheses have been explored, the more recent ones hopefully more sophisticated than earlier ones. With that literature as background, we may proceed to the

Results of Consideration (Step 3).

3a. The network is composed of lines and nodes, organized as NECTIONS, each nection having a NECTION CENTER (Lamb 1984). From the nection center, in opposite directions, lines branch outward at nodes. (See Figure 2.)

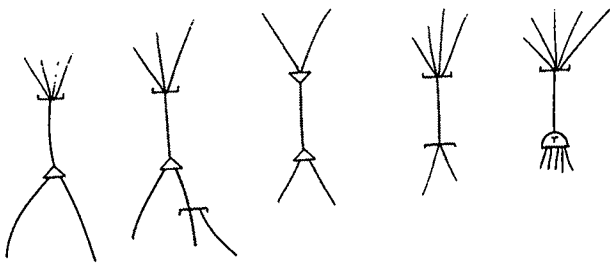


Figure 3. Some Typical Nection Types.

3b. There are multiple stratal systems, each having multiple levels of network structure, each composed of interconnected nections.

3c. In general, a typical nection has two major functions, and there are two basic types of nection, differing on the basis of their first function. The *first* function is either INTEGRATION or EQUALIZATION. The INTEGRATIVE nection, or INTEGRATOR, has an AND node or relatively high-threshold node (see below, Step 5) on the lower side (i.e., on the side

closer to expression) of the nection center; while the EQUALIZING nection, or EQUALIZER, has an OR node (or low-threshold node) on the lower side of the nection center. As an integrative structure in perception or interpretation, the integrative nection requires a combination of features to be simultaneously present and allows such a selected combination to be apprehended or treated as a unit. The EQUALIZER, by virtue of its OR node, treats a variety of alternatives as functionally equivalent. It is found in the situations usually referred to in linguistics as *alternation*.

The *second* of the two major functions of the nection (of either type) is DISTRIBUTION. As a distributive structure the nection allows whatever it has integrated or equalized to be treated as a unit to be *distributed* to more abstract nections at the next higher level of integration and/or equalization.

3d. In keeping with their distributive function, nections usually have more lines --- i.e., more branching, on their upward sides than on their downward sides; and, by the same principle, higher layers tend to have more nections than lower layers. This observation is directly correlated with the observation from taxonomic linguistics that the number of lexemes in a system is greater than the number of morphemes, which is greater than the number of phonemes, which is greater than the number of phonons.

Step 4. Problem: How does the network function for speaking and understanding?

If there were no reasonable hypothesis of how the linguistic system(s) of the theory can be put into operation to perform the processes of speaking and understanding, which people obviously do perform, then there would be no reason to consider it to be a model of the linguistic system(s) of actual human beings. It is on this basis that most linguistic theories, such as the various versions of generative grammar and "cognitive grammar", fail to qualify as true cognitive theories.

Results of Consideration (Step 4).

4a. Analyze the nodes as having internal structure that enables them to perform the processes which they must perform.

4b. Distinguish between BROAD NETWORK NOTATION and NARROW NETWORK NOTATION, the latter for representing this internal structure. Lines, nodes, and nections of narrow notation are unidirectional. In general, a line or nection of the broad notation corresponds to two lines or nections of narrow notation, one for each direction.

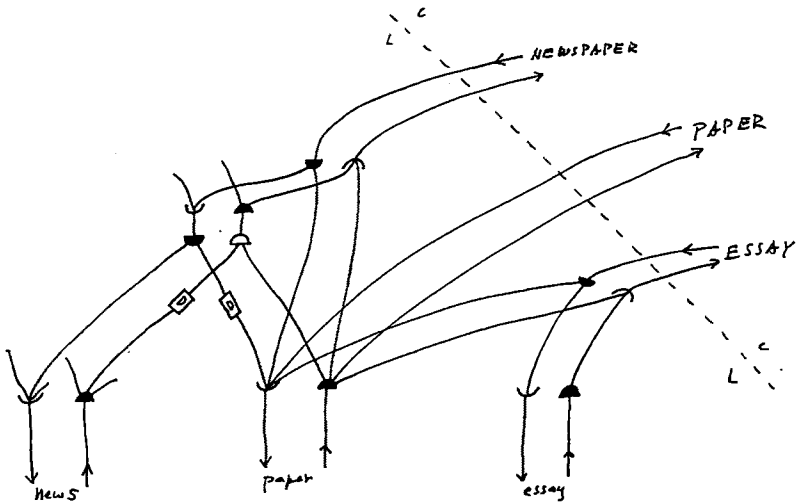


Figure 4. Narrow Notation for the Relations of Figure 2.
 (The little boxes with "D" inside represent delay elements of unspecified internal structure, which are controlled by connections from some central timing device, according to one hypothesis of the sequencing described by the ORDERED AND of the broad notation.)

4c. Lines and nodes, and thereby nections, get ACTIVATED when the linguistic system is in operation, and activation travels through different nections and levels and subsystems of the network, along the lines as governed by the nodes.

Figures 4 and 5 show an analysis into narrow notation of the fragment of network structure shown in broad notation in Figure 2. The difference between these two figures is at this point just a matter of notational convenience, as we have not yet established a basis for choosing between them. Figure 4 is based on the assumption that the nections of narrow notation which correspond to a nection of broad notation are adjacent to one another, and thus appears to be closer to Figure 3; while Figure 5 separates the lines and nodes of one direction from those of the other.

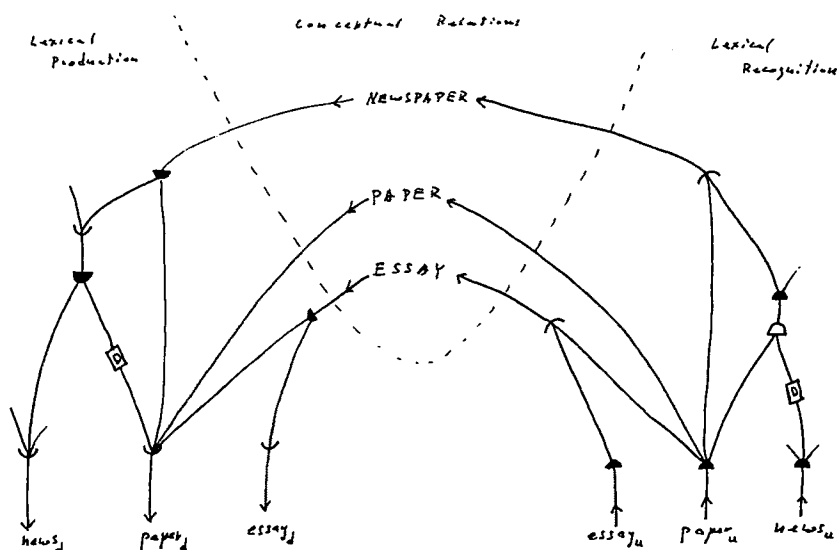


Figure 5. Alternative Version of Narrow Notation for Figure 2.

Step 5. Problem: What about scalar phenomena in speaking, thinking, and understanding?

At Step 4 we have dealt with the most obvious properties of a system that is used for speaking and understanding, but only those. A closer look reveals many phenomena for which it is not enough to just say that a given line is activated or not activated. Rather, we need degrees of activation along a scale. The most obvious examples are found at the conceptual level: Although sparrows and penguins are both birds, it is more immediately obvious in the case of a sparrow; a penguin is, to be sure, a bird, but not as clearly so as a sparrow. So also, a cup made of transparent glass is still a cup if it has a cup handle; but take away the handle and it is more intermediate between cup and glass; make it a little taller and it is more glass than cup.

Results of Consideration (Step 5).

5a. Allow for variable degrees of activation of lines by means of variable degrees of satisfaction of thresholds of nodes.

5b. Allow for variable strengths of connection of lines to nodes.

As with the difference between broad and narrow notation, we can have varying degrees of precision in specifying thresholds. The simpler type of threshold node, illustrated in Figure 6, is based on a suggestion of H. A. Gleason Jr. in a course at the Linguistic Institute of 1971. The node has an integral threshold t whose value is not less than one nor more than the number of input lines. This value may be written inside the node. If $t = 1$ it is an OR node; if t is the number of incoming lines it is an AND node; if the value of t is intermediate between these limits, the node is intermediate between AND and OR. Thus, as Gleason pointed out, AND and OR are just special cases of the threshold node, which is more basic, since they can be derived from it.

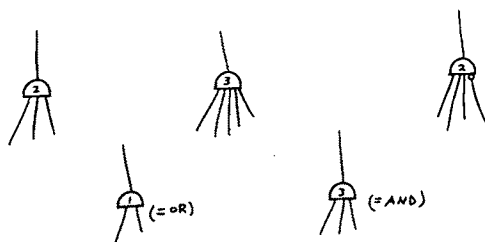


Figure 6. Some Threshold Nodes.
(The tiny circle represents an inhibitory connection.)

But we may also let the threshold node allow for a greater degree of incoming activation than that which is minimally sufficient to satisfy the threshold, for example a threshold node with four active incoming lines and a threshold of two. In such a case the threshold is more strongly satisfied, and we can allow for such stronger activation to be communicated from that node to others by allowing lines to carry degrees of activation rather than just being active or inactive at a given moment.

This principle can then be extended to allow for a continuous scale of degrees of activation, based on a continuous scale of degrees of threshold satisfaction, by means of a THRESHOLD FUNCTION for each threshold node, which determines a degree of outgoing activation based on the summation of degrees of activations of the incoming lines (with inhibitory connections having subtractive value). Nodes with such a threshold function can be diagrammed with T written inside the node symbol rather than an integer.

Step 6. Problem: How can we account for the syntactic phenomena observed in the linguistic extension?

The considerations involved here are discussed in a recent LACUS paper (Lamb 1992).

Results of Consideration (Step 6).

6a. Phenomena of the linguistic extension need not be directly represented in the linguistic system. The temptation to carry syntactic structures from taxonomic to generative accounts and from there to cognitive accounts must be resisted.

6b. From the standpoint of the linguistic network, the phenomena of syntax require that the network provide for (1) sequencing --- controlled by sequencing structures with delay elements and timing devices, (2) conceptual categories, (3) analogical formation of new lexical nections.

Step 7. Problem: How can we account for "secondary" linguistic processes: inner speech, the practice of rehearsing and monitoring one's speech; the ability to repeat nonsense syllables or words whose meaning is not known?

In the "primary" use of language, the process of understanding "operates on" inputs received from auditory perception, and that of speaking operates according to activations received from conceptual nections (that is, one speaks in order to express some thoughts). But our linguistic systems also obviously allow for other modes of operation.

Results of Consideration (Step 7).

7a. Allow lines from phonological production nections to phonological recognition nections, to allow for "inner speech" and related phenomena. Such lines are summarized in Figure 7 by the line labeled "1".

7b. Allow lines from phonological recognition nections to phonological production nections. Such lines are summarized in Figure 7 by the line labeled "2".

Figure 7 is based on the diagramming convention of Figure 5 (above), in which recognition nections are locationally separate from production nections, as opposed to that of Figure 4, which has the nections for production and recognition adjacent to one another. Figure 4 is thus more in keeping with Figure 1. As mentioned above, we have as yet no basis for choosing between these alternative schemes.

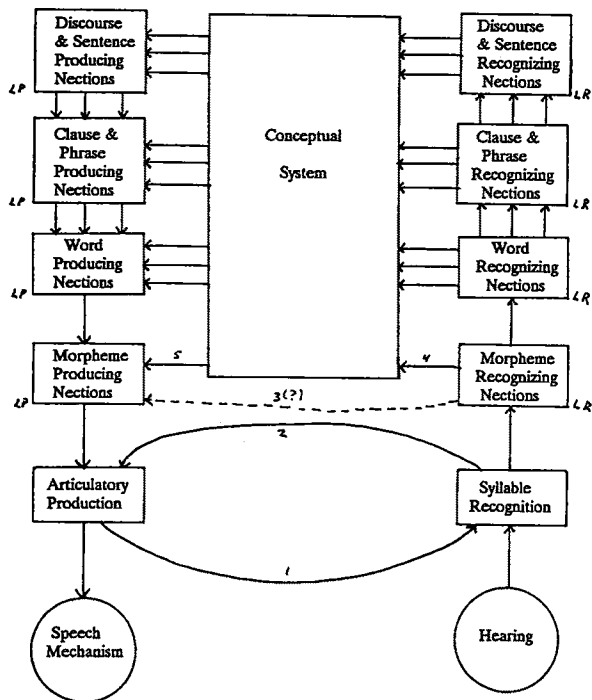


Figure 7. Overall System with One-Way Network Structures.
In this figure, the boxes labelled "LP" represent different levels of a single *lexical production* hierarchy, and those labelled "LR" are for the *lexical recognition* hierarchy.

Step 8. Problem: How is the linguistic system related to other cognitive systems?

Work on the visual system show that it too is probably a multi-layered network (Biederman 1987, Hummel and Biederman 1990). Likewise, some preliminary explorations whose results have not been published suggest that other cognitive subsystems also have network structure. It is apparent also that these various cognitive subsystems are interconnected and that the conceptual system, by its nature, is a kind of integrating center which provides the connections that allow us to talk about just about anything we perceive in any of the perceptual systems (Lamb 1994). If they are indeed in general agreement in having network

structure, then it is relatively easy to see how their interconnections are also in the form of network structure. Given the complexity of the overall cognitive system, with its many subsystems, we need the further considerations of Step 10 (below) to go beyond these preliminary results:

Results of Consideration (Step 8).

8a. (At least most) other cognitive systems evidently are also networks.

8b. The linguistic system is connected to other systems, especially through the conceptual subsystem.

Step 9. Problem: How can we account for learning and creativity?

Both learning and creativity involve changes in the network. These changes are of two main types: adding new nections, and adding new connections among nections which already have specific functions. In addition, we can posit "fine tuning" operations of adjusting thresholds and strengths of connections.

The term "learning" covers various related processes not yet treated in the above considerations, but implied in the new proposal for "syntax" mentioned above (Step 6). They include both the early phases of learning undertaken by infants and young children and the later learning of new vocabulary (with associated concepts) and new meanings for old words, as well as the learning of "foreign languages".

The term *creativity* has had a certain magic for some linguists and others in recent years. Much has been said about creativity in language that is more a matter of public relations than of actual substance. Claims about creativity have made some people suppose, with eyes aglow, that certain models of language have certain almost magical qualities. It has been said that language is creative and that generative grammar captures the creativity. But if we look closely and think about it, we see that the only approach to creativity provided by generative grammar is its ability to put words together into sentences using established syntactic constructions. Is this creativity? It is essentially just taking a sequence of categories and for each category selecting one of its members. This type of operation is like that of any sequential activity in which a choice is available at each point in the sequence --- such as ordering and eating a meal in a restaurant, or going through a cafeteria line. Those who think it is marvelous that we can produce a new sentence that they have never heard

or said before --- do they also think it is marvelous that we can go through a cafeteria line and select a meal that they have never eaten before?

No, this is not creativity. Creativity is when we invent new lexemes for new or old concepts; when we figure out a new concept, especially one which integrates ideas in our conceptual systems that have not previously been connected; when we devise new metaphors in our attempts to understand some combination of complex experiences; when we invent a story or a tune or a machine; when we visualize a new structure, perhaps a new landscape or building or city plan; when we invent a new way of saying something that does not fit the standard syntax. Generative rules made of symbols don't tell us anything at all about these processes.

Creativity is such a vague and ill-defined term that it can't be of much use to us unless we can endow it with a little precision. Relational network theory provides a means of doing so. In a network we can see creativity as the building of new network structure, and we can see different degrees of creativity as differing amounts of new structure. Adding a new connection between existing nections is a relatively low-level instance, while the construction of a large interconnected group of nections, perhaps spanning more than one modality (subsystem), is at a high level of creativity.

It is not just any new structure building, however. Learning new vocabulary items is building new structure in the lexical system. The ordinary process of understanding a story includes the building of new network structure at the conceptual level. This relatively uncreative process is GUIDED STRUCTURE BUILDING, in which the incoming message tells the hearer's system, as it were, just what and where to build the new nections and connections. Creativity, by contrast, is *unguided* structure building, and we can allow for varying degrees of creativity on the basis of how much new structure is being built as well as how different it is --- i.e., how loosely connected --- from previous structure. All new structure must have shared properties with already existing structures. The relatively less creative structure building is that which departs only slightly from its exemplars, with substitutions based on high degrees of similarity.

If creativity and its degrees are reckoned by means of their bases in network operations, then the process of ordinary sentence formation is a matter of analogy and substitution, according to the results of Step 6. It involves the formation of new lexical structure on the analogy of existing structures as exemplars. Accounted for in this way, it can be seen as mildly creative.

Results of Consideration (Step 9).

9a. The system must have LATENT NECTIONS along with those which are already DEDICATED to a function.

9b. Dedicated nections must have LATENT LINES to allow them to expand their functioning.

9c. Thresholds and strengths of connections of lines to nodes must be adjustable based on experience.

9d. The linguistic system can be expected to be readily changeable, and may undergo slight change every time it is used (corollary of 9c).

In 9a we make a distinction between ACTIVE NECTIONS and LATENT NECTIONS. Latent nections may be considered to have numerous potential connections to neighboring nections, representing the range of possibilities available for their functioning upon becoming active. Most such connections may be thought of as already present but having zero weight; they may be called LATENT CONNECTIONS. Each latent nection thus has a wide range of potential functions. When a nection is needed to "carry" some new information, a latent nection is RECRUITED for the purpose from among those whose latent connections are in the right places. These latent connections, a small subset of its available latent connections, become activated (that is, their weights increase from zero), and the nection is thus converted from a latent nection to an active one. Other connections from the newly recruited nection may get activated at a later time as it acquires greater "power".

Step 10. Problem: Can we say anything about where the various cognitive systems are located relative to one another?

Part of this problem has been alluded to: the choice between the scheme of Figures 1 and 4, on the one hand, and that of Figures 5 and 7, on the other; that is, are the networks for recognition and production adjacent to one another or separate from one another? At a broader level, the problem beings in also the interconnections with various other cognitive systems related to the linguistic subsystems.

In all the considerations up to this point, relative locations of different portions of the cognitive network have not been a factor. We have taken for granted that what counts about network connections is just that they exist and/or can be formed and/or strengthened or weakened. For Step 10 we introduce a new factor: relative *lengths* of connecting lines.

This is the basis for making choices of the type mentioned in the preceding paragraph. For some, such questions may be of little interest, as they have not been of concern earlier in linguistic theory. But it is natural to raise new kinds of questions when we have finally made some modicum of progress with earlier questions.

Continuing with the considerations of Step 9, we may assume that the process of recruitment takes place, for a given nection, when there is simultaneous activation present at points to which it is connected on both its input and output sides. The process is not different from that which accounts for Pavlov's famous experiment involving salivating dogs. The limitations of behavioristic models, and those of early neural network models such as the perceptron, were only in their failure to include multiple levels of available cognitive structure between input structures and output structures.

It is necessary that latent nections be available throughout the network at places where new information can be acquired. Thus there must be large numbers of latent nections in the lexical and conceptual areas of the network. For a model intended to represent an actual human being it is necessary to have hundreds of millions of latent conceptual nections. It might be objected that without astronomical numbers of latent nections, this model would be limited in its ability to learn new things. The reply to that objection is that we can indeed observe limitations in our ability to learn and to apprehend and understand the world, and we can observe such limitations in others if we pay attention. Such deficiencies may well be related to limitations on the numbers and available connectivity of latent nections. We can of course observe even greater limitations in our dogs, cats, and horses, not to mention senile aunts or grandparents or other acquaintances. In the latter cases we may suppose that large numbers of latent nections have become damaged so that they are no longer available to be recruited for capturing new information.

Bringing latent nections into use is a process of bringing some of their incoming lines into a level of strength sufficient to satisfy an initial threshold function. Upon thus being brought from latency into use, the nection enters upon a specific function. For example, it may represent some new concept, representing the combination of features at the other ends of the newly activated connecting lines. This process is often a gradual one, as may be readily observed in the learning of new lexemes, either in one's native language or in foreign languages. Thus there is really no sharp boundary between latent and active nections.

Similarly, the addition of new lines is a gradual process. New connecting lines gradually grow in strength as a result of successful use,

starting from an initial very weak or zero strength. The addition of new lines can be seen as a special case of the strengthening of lines, a feature needed for the variation described above.

We may distinguish two types of new lines: (1) those connecting to heretofore latent nections; (2) those connecting to nections which are already active. The latter lines represent new features being added to an existing concept or other nection.

For such a model to work it is necessary not only that there be millions of available latent nections, but also that latent nections be present in different places throughout the network where they can be available when needed. Of course, what matters is not their actual location but those of their connecting lines. To make possible the flexibility of learning which we observe in ourselves and others (which some people perhaps mistakenly experience as virtually unlimited), the system has to be organized such that a given latent nection is not prededicated to a specific function. Thus they must be effectively present throughout the network; and yet the presence of different latent nections in different positions implies a *partial* dedication in advance --- to a range of possible functions. In keeping with these considerations, it seems reasonable to assume that a latent nection has on its downward side perhaps hundreds or even thousands of latent lines, assuming a specific function when a small subset of these becomes active.

We can provide for even greater adaptability by allowing the system to grow new lines when there is no latent nection available for a given function. This process would be one which takes time, for repeated activations, and probably also a certain amount of *attention* (another dimension of structure which has yet to be specified in the model). Having these two different methods of recruiting latent nections would provide a means of accounting for the differentials in learnability which we all experience. For example, it is relatively difficult for humans to learn to associate faces with names --- to learn the names of new acquaintances. It is for this and similar situations that mnemonic devices are invented which rely on visual imaging. Such a device can establish a new connection between a visual nection or group of nections and a lexical nection by making use of visual-lexical connections already established. The mnemonic technique allows the need for a new connection to ride on the coattails, as it were, of this existing one, until such time as the new connection will have been grown.

The features of the learning model as sketched so far imply that there will be competition among latent nections. Since there must be many latent nections throughout the network having the flexibility needed by the

model, the system will have more than one latent nection available for virtually any given combination of properties. Thus the question next arises of which of the many available latent nections becomes activated for a given new situation. One hypothesis worth considering is that more than one is "chosen". Of several such nections, future experience of the system could provide additional properties differentially to distinguish them from one another, as effective subtypes; while perhaps one of them might remain unspecialized and would thus represent the category as a whole. This possibility will be left on the shelf for the present. It is possible that it operates along with that proposed in the following paragraphs.

Another answer is that, of the multiple possible latent nections, the one "chosen" is the one which is closest to the activated properties. This answer is in keeping with the competition device for contrasting nections, often observed in phonology and in vision, by which a nection upon being activated blocks its neighbors having similar properties by means of the activation of inhibitory connections --- lateral inhibition. For the closest one (that having some kind of "composite closeness" based on all the pertinent connecting lines) is the first one activated, assuming uniform speed of transmission of activation for all these previously uncommitted connections; it then blocks the competition.

We would have as a consequence a built-in efficiency in the resulting system, in that integrating nections will generally be maximally close to their parent nections --- those for the features which they integrate. This principle may be called the PROXIMITY PRINCIPLE.

Results of Consideration (Step 10).

10a. The Proximity Principle: Functionally related network structures will tend to be geographically close to one another in the network and vice versa --- nections which are physically close to one another will tend to have related functions. Likewise, sensory perception networks should in general be relatively close to the sense organs whose information they receive, the lower levels being the closest (Note 2).

If we like, we can next focus more closely on the vague notion of "closeness" or "composite closeness" to see how it might be defined. Since the nection "chosen" is the first one activated based on a combination of connections, it must be reached by activation from all of those connections before any competing latent nection is so activated. Assuming uniformity of speed of transmission for these previously inactive connections, the limiting connecting property is that whose nection is farthest away. Thus among several latent nections latently connected to a given combination of property nections, the one winning the competition will be that whose

longest connection from those property nections is the shortest. In other words, if we compare the longest connections from the given property nections to each of the candidates for their integrating nection, the shortest of those longest connections determines the "winner". That being the case, and assuming the presence of numbers of latent nections fairly evenly distributed throughout the network, it will follow that the one recruited for any given integrating function will tend to be roughly equidistant from its parents.

10b. As a consequence, nections in "competition" with one another -- that is, having similar functions --- will tend to be effectively adjacent to one another. Thus whenever a number of nections with similar properties have been activated we will have a "family" of nections which will be likely to be effectively adjacent or nearly adjacent to one another. This property is likewise consistent with the phenomenon of blocking competition, as competing nections will tend to be adjacent (Note 3).

10c. The proximity principle gives us a basis for answering the question of whether the encoding and decoding networks are adjacent or separate. It suggests that the structures for phonological recognition ought to be close to the ears, while those for articulation ought to be close to those which control other muscles of the mouth and related areas. That would make them separate from each other geographically. Likewise, we should expect Lexical Recognition to be close to Phonological Recognition, Conceptual Structure to be close to High Level Visual Integration, and so forth.

10d. A rough scheme of relative locations of linguistic subsystems and closely related other systems can now be hypothesized, based on the foregoing results. In particular, the proximity principle places the phonological recognition subsystem close to the auditory sensory system (ear, inner ear), while the phonological production system should be close to or part of the system for controlling muscles of the face, tongue, and neck. With these placements as starting points, the proximity principle leads to a layout like that shown in Figure 8, in which (1) nections devoted to a similar range of functions (e.g., lexical recognition) are placed together, and (2) such groups are, as far as possible, placed close to other groups to which experience and observation shows they must be closely related. (But Vision and "Other Perception" are more or less arbitrarily placed.)

Among other things, the design sketched in Figure 8 includes an answer to the question of whether the systems for recognition and production are adjacent, as in Figures 1 and 4, or separate, as in Figures 5 and 7. Figure 8 is consistent with Figure 7 (and it summarizes Figure 7's separate boxes labelled "LR" as "Lexical Recognition; similarly for "Lexical

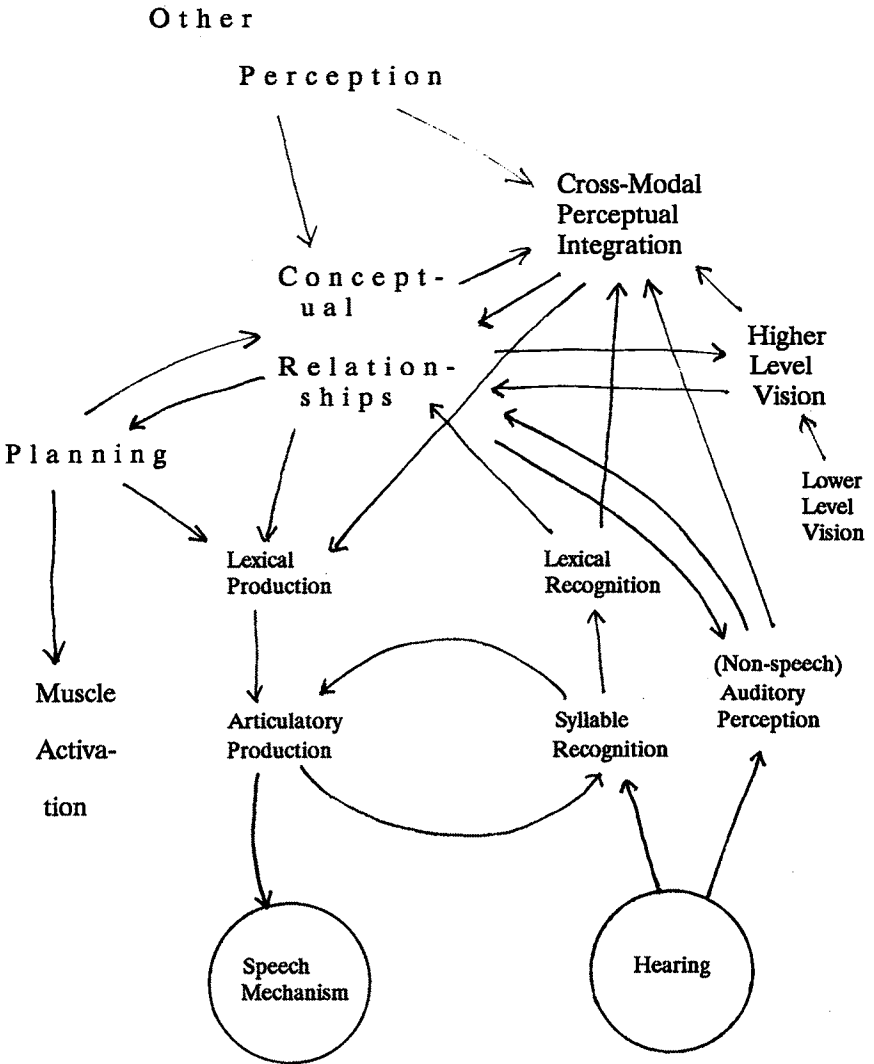


Figure 8. The Linguistic System with Other Cognitive Subsystems. "Muscle Activation" may be considered to occupy a large area with subareas for different parts of the body; Articulatory Production is a specialized muscle control subsystem. "Other Perception", arbitrarily placed in the figure, covers several subsystems for touch and detection of position and movement and other feelings, including different subsystems for different parts of the body.

Production"). Further evidence for such separation is provided by the easily made (and frequently made) observation that children and other language learners have much greater facility in understanding than in producing --- suggesting that the connections in the linguistic system for getting from expression to meaning are not the same as those for the opposite direction.

Part 2: Relationships Between this Network Model and the Findings of Neuroscience

We are now ready for the second part of this study. What correlations can be found, if any, between the results from linguistic study, reviewed above, and findings from neural science? Comparisons of the findings may be made at a microscopic level and at a macroscopic level.

The Microscopic Level: Nections and Neurons

In our linguistic system, the basic structural elements of the microscopic level are nections. They invite comparison to neurons, the basic modules of which neural networks are built. Here of course, we are thinking about nections of the narrow notation, since those of the broad notation are just notational abbreviations for pairs or larger aggregates of those of the narrow notation.

A good survey of current information on the structure and functioning of cortical neurons may be found in Eric R. Kandel, *Nerve cells and behavior*, Chapter 2, and Kandel, Siegelbaum, and Schwartz, *Synaptic transmission*, Chapter 9, of Kandel, Schwartz, and Jessell, *Principles of Neural Science* (Third Edition, Elsevier, 1991).

We find some remarkable correspondences. They are in fact close enough that one could consider the nection to be a (highly) simplified model of the neuron. It agrees with the neuron in all essential properties --- for example, it is known from the neural sciences that neurons send out varying degrees of activation in response to varying degrees of incoming activation, and that learning involves both changes at synapses and the growth of new nerve fibers --- except that the typical neuron is far more complex than nections as described in the foregoing pages. For example, the typical neuron has thousands of connections to other neurons, up to twenty thousand or more, on the input side, and can have as many on the output side. This quantitative difference, which in any case should not be minimized, should be considered in relation to three factors:

- (1) We are not claiming a one-to-one correspondence between nections and neurons. Everything we learn about neurons and their interconnections and behavior reminds us that they are far more complex than even the most wildly complex models than humans have been able to imagine.
- (2) The nections as depicted in diagrams show only those lines that have been activated; but according to our learning hypothesis (Step 10 above), each nection has a very large number of latent connections to other nections, of which only a small subset gets selected when the nection is recruited for a specific function.
- (3) We must recognize that even our models of nections that have been recruited are highly simplified, showing only the most obvious connections. We should not mislead ourselves into supposing that any account that a linguist could come up with can completely represent all the complexity actually attached to the items of linguistic knowledge people have in their brains.

Aside from the general observation that neurons are in various ways more complex than nections, there is one feature of neural interconnection that may be worthy of particular attention. Nections of the linguistic model are treated as interconnected by means of interconnecting lines, and no distinction is made in the model that corresponds to the distinction between axons and dendrites. Fibers from the axon of one neuron can connect, by means of synapses, either to the cell body of another neuron or to one of its dendrites. It may be worthwhile to ponder how this difference is related to learning, and it may be that a more sophisticated version of relational network theory will need to incorporate a similar distinction for nections.

The Macroscopic Level

The relational network model as sketched above includes various principles of organization of the nections and groups of nections into larger structures, including three major architectural properties: (1) hierarchical organization, also known as layering or stratification (cf. 3b above), (2) the principle of *distribution* (cf. 3d above) with its consequence that each higher layer of a hierarchy has a larger number of nections than the next lower layers; and (3) the PROXIMITY PRINCIPLE (10a), according to which nections which are physically close to one another tend to have similar

functions and *vice versa* --- that is, those which have similar functions tend to be physically close to one another.

As mentioned above, the proximity principle provides the justification for most features of the organization of Figure 8. In other words, it is reasonable to suppose on the basis of the proximity principle that the nections of the different subsystems identified in Figure 8 are not only similar in function but also, in large part, relatively close to each other in location. We might hypothesize, therefore, that it may be possible to find areas of the cortex corresponding to some or all of the subsystems identified in Figure 8. Also, by the same line of reasoning, we can hypothesize that functionally related subsystems in the cortex ought to be relatively close to one another, as suggested by the model. Thus perhaps the cortex actually has something like the "Lexical Recognition" hierarchy of Figure 8, with its lower levels close to a hierarchy for "Syllable Recognition". Likewise, the prediction of the model is that the cortex has something corresponding to the "Planning" area, which ought to be close to a "Lexical Production" area as well as to other muscle activation subsystems; and different but related kinds of planning centers of the cortex ought to be close to one another.

It also follows from the considerations of Step 10 that the proximity principle applies even though higher level nections (i.e., those relatively far from sensory and motor organs) do not have predetermined functions but only acquire their functions on the basis of the experience of the system.

Although it might seem that to make such assumptions is quite natural, it is actually in conflict with various other hypotheses of cortical organization that have been put forth. For example, some have argued in favor of a holographic theory of the brain, based on holography as an exemplar, according to which different cortical functions are not localized at all.

One might therefore interpret Figure 8 as laid out not just on a functional basis without regard to location, but as presenting some rough hypotheses about localization. For such interpretation, one may consider that we are looking at the left side of the cognitive system as a physical system with the front at the left, the back at the right. The figure shows the "Speech Mechanism" as anterior to "Hearing" in keeping with the fact that the ears are farther back than the mouth, which is the main portion of the speech mechanism. And the placement of "Syllable Recognition" near "Hearing" is not just functional but a hypothesis about localization which follows from the proximity principle. And so forth.

Of course, we also have to reckon with the fact that there are two ears, one on each side, and two cerebral hemispheres. At this point we can hardly avoid making use of a well-known property of cortical organization, the phenomenon of hemispheric lateralization. It is well known from various kinds of neurological evidence that the motor control subsystem of the left hemisphere controls muscles of the right side of the body while the right hemisphere controls the left side. It is also known that most right-handed persons have most of their linguistic capabilities provided by subsystems of the left hemisphere. (For left-handed persons, the picture is more complex: For some it is the right hemisphere, for some the left, and for some both are involved.) Accordingly, Figure 8, if interpreted as roughly representing some hypotheses about localization, is to be taken as applying to the left hemisphere. In fact, it appears that portions of both hemispheres near the ears are involved in the interpretation of speech, with the left handling most of the details (for normal right-handed persons) while the right handles intonation and perhaps some other features of vowels (except for Japanese!).

The one feature of the figure which departs from the considerations about localization based on the proximity principle is that the visual perception subsystem is placed at the right, representing the rear, even though the eyes are at the front. In this case, knowledge of localization in the cortex, rather than linguistic or other evidence, was what dictated that placement. This localization of vision is of course a contradiction to the general principle that lower perceptual levels are relatively close to their corresponding sense organs. But this one dramatic exception does not invalidate the principle as a general principle (cf. Note 2). It is well-known (and the knowledge was considered in the construction of the figure) that there is a bundle of nerve fibers, the optic nerve, which carries activation from the first few neural levels, which are indeed near the retina as the theory would predict, to the back of the cortex.

In summary, the model predicts, based on linguistic and psychological data (rather than neurological data except as noted above), that the following general features ought to be found to a large extent in the cerebral cortex:

- (1) hierarchical organization (2b, 3b above);
- (2) relatively smaller numbers of nections at functionally lower levels of the hierarchy and higher numbers at the higher levels (3c, 3d);
- (3) localization of function, in accordance with the proximity principle (10a, 10b);

(4) location of lower levels relatively close to the sensory and motor organs to which they are functionally connected, and location of higher levels relatively close to the lower levels with which they are functionally associated (10a);

Turning now to the neurological evidence, what do we find? First we should observe that the cerebral cortex is enormously complex and that the information available from the neural sciences, while it has been increasing rapidly in recent years, is still too limited to provide clear confirmation or disconfirmation of some of the features of the model set forth here. Also, there is still a great deal of disagreement among neural scientists on many of the points relevant to our inquiry. That having been said, it may be added that we find a remarkable degree of correspondence of the neurological evidence with various features of the relational network model. And, except for the fact already mentioned that the visual subsystem is actually as far away as possible from the eyes rather than close to them, *all* of the points listed above are in general confirmed.

On the general point of hierarchical organization there is clear consensus among neural scientists for at least some of the features of hierarchical organization of the relational network model. Property (2) in the list above seems to be quite generally accepted as a property of cortical structure (cf. Kandell, *Nerve Cells and Behavior*, Chapter 2 of Kandel et al. 1991, especially Figure 2-6). More explicit and more detailed recognition of hierarchical structure in the cortex has come from the work of such investigators as Konorski (1967) and from extensive work by Hubel and Wiesel on vision in cats.

With respect to localization of function (3 and 4 in the list above), there has been considerable controversy among neural scientists in the past, but evidence coming forth in recent years from newly developed technologies such as positron emission tomography (the PET-scan) has provided clearer and clearer evidence supporting localization (Note 4).

Celebrated early studies of loss of speech functions were conducted by two pioneering neurologists, Paul Broca and Carl Wernicke (working at different times and places). Broca had a patient who could understand speech but could not talk. After his death, examination of his brain revealed damage to a portion of the left hemisphere which came to be known as *Broca's Area*. Later, Dr. Wernicke had a patient who could speak but who could not understand speech, and it was determined that he had damage to a portion of the left hemisphere farther back than Broca's Area, an area which is now known as *Wernicke's Area*. Broca's area corresponds to *Lexical Production*, and Wernicke's area to *Lexical*

Recognition (and perhaps also *Syllable Recognition*), in Figure 8. Since the time of Broca thousands of other similar patients have been examined, most of them stroke victims. Such persons are said to be afflicted with "Broca's Aphasia", and it is quite common for them to also have some loss of muscle control on the right side of their bodies --- this finding too is in accord with the proximity principle as sketched above.

As a set of hypotheses and as a basis for further investigation, some tentative correlations between the linguistic results summarized in Figure 8 and areas identified by neural science are proposed in Table 1. (See Chapters 1, 53, and 54 of Kandell et al. 1991 for information on the Cortical Areas identified in the table.)

Table 1. Possible Cortical Locations of Subsystems of Figure 8.

Subsystem of Fig. 8	Cortical Area
(Non-speech) Auditory Perception	Primary (and Higher-Level?) Auditory Cortices
Lexical Recognition (and Syllable Recognition?)	Wernicke's Area
Conceptual Relations and Cross-Modal Integration	Angular Gyrus and probably other locations
Lexical Production	Broca's Area
Articulatory Production	Vocalization region of motor area
Lower Level Vision Higher Level Vision	Visual cortex
Other Perception	Somatic sensory cortex (and other areas)
Muscle Activation	Motor area (Precentral gyrus)

The central portion of Figure 8, called "Conceptual Relations" covers information of various kinds, probably corresponding to more than one cortical area. Based mainly on the work of Norman Geschwind, we may tentatively identify the Angular Gyrus as the seat of some of the conceptual information as well as much of the "Cross-Modal Perceptual Integration" of Figure 8. Additional conceptual structure relating to planning may be located in the frontal lobe.

Notes.

1. In a class I taught at the Linguistic Institute at the University of Michigan and in a public lecture presented at that Linguistic Institute.
2. Vision is a known exception. But Peter Reich pointed out in the discussion following the lecture that in the earlier stages of evolution the visual cortex was close to the eyes, and it got "pushed back", as it were, by the growth of intervening structures during the course of evolution.
3. Thus we have a right to assume that inhibitory connections from nections to their immediate neighbors at the same level are present as built-in features --- i.e., not acquired through some learning process --- even before any of them have been recruited for specific uses. In other words, adjacent nections will be structured, and appropriately so, as having mutually contrastive status even before they have acquired their functions!
4. The neurological evidence on localization comes largely from work with people who have had medical treatments for such problems as strokes, seizures, and head injuries. In the case of strokes and head injuries affecting just a small portion of the brain, certain impairments of mental functioning are observed, such as inability to speak. Information about localization comes from correlating the type of impairment of functioning with the location of the damage to the cortex. In the case of patients with seizures, doctors sometimes find it desirable to surgically remove the portion of brain tissue which is found to be responsible; but before such removal they test to determine whether the portion to be removed is dedicated to some important function such as speaking.

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**On the primacy of cognitive, socio-interactive, or genetic factors
in explaining language development:
support for an alternative "ecological" perspective**

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I wish to begin by submitting to you certain problems of a fundamental nature. The problems relate to hypotheses of the ontogeny and phylogeny of language, hypotheses which have led to a fragmentation of linguistics into different schools of thought. There are three dominant viewpoints on the development of language.

First, there is the cognitive view rooted in the work of Piaget. This perspective has been expressed by Bloom (1970), Bowerman (1973), Slobin (1973, 1985), and Hakes (1980), among others. The hypothesis suggests that the development of linguistic units and syntax are the behavioral expression of underlying conceptual or semantic processes. Language development reflects the child's increasing ability to structure constructs and "knowledge", a sort of mapping of form onto growing mechanisms of conceptualization.

Second, there is a functionalist or pragmatic-based perspective suggested by such authors as Halliday (1975), Bates and MacWhinney (1979, 1982), and Givón (1979). The claim is that pragmatic factors play a primary role in language development and that communicative functions crucially shape linguistic structures and units. In a sense, language form is seen to follow from functional motivations and acquired pragmatic knowledge.

I draw your attention to problems facing the above hypotheses, specifically when one attempts to account for language development in subjects suffering from what some call "non-verbal learning disabilities", or the NLD syndrome (Goldberg & Costa, 1981; Rourke, 1988). This syndrome is associated with neuropathologies present in early childhood (for details, see Rourke, 1988). The individuals manifest marked deficiencies in performing simple tasks involving concept formation, problem solving, and formal operational thought. Their discourse is semantically poor, often stereotypical, inappropriate and lacking in cohesion, to the point that the term "cocktail party speech" is used clinically to characterize their abnormal pragmatics. And yet, the individuals acquire phonology, words, morphology, and produce complex syntax.

To better illustrate this, I mention Yamada's (1990) case study of Laura. Laura's pragmatic and cognitive skills as an adult were at the levels of a 3-year-old. She had trouble counting 3 or 4 separate items, could not arrange items along dimensions such as size, she did not know her own age (contrary to most 3-year-olds), had no concept of money values, and could not solve arithmetic problems such as three plus one. On testing Laura's conversational pragmatics, she was found to have error rates reaching 39% whereas normal 3-year-olds scored under 2%. But Laura's phonology, morphology and syntax were rich and adult-like in many respects. Yamada was led to reject the hypotheses that language development rests on conceptual and/or pragmatic knowledge. Instead, she favored a third viewpoint.

This third hypothesis has been expressed by generativists like Chomsky (1975, 1980), and by Lenneberg (1968), Fodor (1983), and Newmeyer (1983), among others. The claim is that the language capacity is modular, that is, it develops separately from other cognitive functions, it is genetically determined, and it is located in the left hemisphere of the brain (see Chomsky, 1982). This view also addresses the question of the phylogeny of language, in a manner which reveals some of the loose foundations of linguistic theories and methods.

Indeed, some critics have noted "the ease with which *a priori*' mental representations' tend to be postulated in linguistics and cognitive psychology" (Lindblom & MacNeilage, 1986, p. 127). What is revealing is that these postulated representations, even the most pivotal concepts, typically have no external origins. For instance, there are no known physical correlates in speech for such forms as phonemes, words, or sentences, so that models and algorithms of syntactic organization take on an arbitrary character (see also Fowler et al., 1980). Without this external support in heard signals, how do children acquire a knowledge of the existence of linguistic units in order to derive rules of syntax? Claims and evidence that language is genetic offer no explanation: if there are no physical correlates for postulated forms, then how did humans *as a species* acquire the biological predisposition to process these forms and their serial organization? On this point, Chomsky's solution is to suspend known principles of evolution, such as the adaptation of organisms to physical aspects of the environment. Such principles, in his view, do not apply to language, and he cites the case of mathematics as a conceptual system evolving from no known interaction with physical properties (Chomsky, 1980, p. 100). However, language does involve physical properties of the environment -- from the fact that it is a communication system, involving the modulation of air waves in the action of speaking. Thus, Chomsky's analogy does not apply, and one is left with a dubious account of functions in living organisms arising without the support of properties in its ecology.

As for suggestions that the language capacity is located in the left hemisphere, Chomsky (1982) and Newmeyer (1983) both cite the research of Dennis (1980, see also

Dennis & Whitaker, 1976). Dennis studied subjects who had either their left or the right cortex removed early in life. For the left hemidecorticates, aspects relating to comprehension of syntax were clearly affected. But Chomsky and Newmeyer failed to note that the subjects, without a left (or right) cortex, still developed phonology and morphology, and were capable of producing a range of syntactic structures in discourse.

In short, none of the above viewpoints provide a tenable account of language development. Among other points, there is simply no physical ecology supporting the development of a capacity to process the types of units and structures postulated in linguistics. However, as I have submitted, universal units and structures of serial organization *are* directly observable. And it seems that the only reason linguists have not attended to such manifest forms is that these are not commensurate with received concepts derived with reference to alphabetic writing. Let me provide examples of this using the pivotal notions of "word", "phoneme", and "utterance" or "sentence".

Defining the word remains problematic. But few morphologists follow the lead of Saussure who rejected the concept altogether. What definitions we have invariably contain semantic and distributional criteria, construed by implicit reference to the given word units of alphabet writing (see, e.g., Kramsky, 1969). As for phonemes, the formal concept was proposed by classical phoneticians following the application of alphabetic symbols to transcribe speech (Jones, 1957). Now, it has been repeatedly demonstrated that phoneme- and word-based segmentation of utterances does not develop in any consistent fashion prior to the acquisition of some reading proficiency (for reviews, see Boucher & Ho, in press; Boucher, in press). Analphabets, on the other hand, have segmentation strategies based on rhythmicity. For example, I have found that adult analphabets can segment a contentive like *#re'turn#* as one unit, but when two stress points appear as in *#'re'open#* they segment *re* and *open* (74% of the time for such cases; Boucher & Ho, in press). Analphabets also perform very poorly on tasks involving phoneme segmentation but have no difficulty in recognizing syllables (Boucher, in press).

Surely there are lessons to be gained from this in defining units and frameworks of serial organization. Yet some linguists and cognitive psychologists go to extraordinary lengths to illustrate the "psychological reality" of alphabet-related concepts. For instance, some see the Greek invention of the alphabet as evidence of a pre-literate awareness of phonemes. Documentary evidence (Sampson, 1985; Faber, 1990; Daniels, 1992), however, suggests that this invention was linked to ancient Greeks adapting the symbols of syllabaries.¹ Others claim that language games such as pig latin or speaking backwards suggest a knowledge of phonemes, ignoring reports that phoneme-based games appear to be restricted to alphabet-writing cultures (see Faber, 1990 and references therein). Still others claim that phonemes are supported by observations of alphabetically-transcribed speech errors, while some reviewers, like Browman and

Goldstein (1990, p. 419), conclude that speech errors "...provide no evidence for the behavioral relevance of the [phoneme] segment".

But what are the gains in considering "units" of rhythmicity as they present themselves to analphabets? Well, they help us formulate a plausible theory of the ontogeny and phylogeny of language. These units are directly perceived, that is, they are part of the physical ecology of human communication via speech. They also relate to low-level structures (structures of the peripheral and limbic systems, and of the diencephalon) which antedate higher-level cortical functions. In short, such units do not clash with principles of evolution. Finally, they define the reference frames by which individuals learn the syntactic organization of particular languages.

To illustrate, consider first the case of rhythmical units relating to stress. I have observed that working and serial-order memory of unstructured sequences operates by stress groups. In memorizing seven-letter sequences like *C, B, T, K, B, D, V*, subjects create groupings not exceeding four syllables (Boucher & Brisson, 1992). This appears to be a universal condition of phonological memory. Such groupings also occur for structured sequences in both stress-timed languages and syllable-timed languages. In French, for example, a sequence like *antidémocratique* is fragmented by a stress-like lengthening of the first *ti* which approaches that of the final *ti*. The implication is that, in learning language, children are confronted with unstructured sequences. Constraints on phonological memory cause a grouping which may coincide with morphological units -- thus providing a possible explanation of the origin of these semantic "segments". I emphasize that phonological memory has been linked to the structures of the diencephalon and limbic system (Dennis et al., 1991), and ability relating to working serial-order memory correlates with language skills (Daneman, 1990; Gathercole & Baddeley, 1990). This suggests that higher-level processing associated with conceptual or pragmatic "knowledge" is not the sole, nor the most important determinant of language development in the initial stages. In fact, studies of parent-child interaction show that younger children's repetitions -- which primarily function as simple imitations (Casby, 1986) -- serve lexical and syntactic development (Bloom et al., 1974). Such reasoning may also explain the emergence of language in cases where conceptual and pragmatic abilities are abnormally deficient.

Another unit of rhythmicity is the syllable, which offers some explanation of the origin of certain distinctive features. As an example, I take the case of voicing for oral stops. When one speaks at slow or fast rates, listeners still perceive voicing distinctions. But in conceiving speech as a sequence of alphabetic-like segments, phoneticians have measured short-time events which repeatedly failed to reveal distinct patterns. Figure 1 illustrates what happens when one measures the release duration of /t/ and /d/. At faster rates, values tend to cluster together, as indicated by the regression lines in the figure. How, then, can listeners make voicing distinctions when events in the signal do

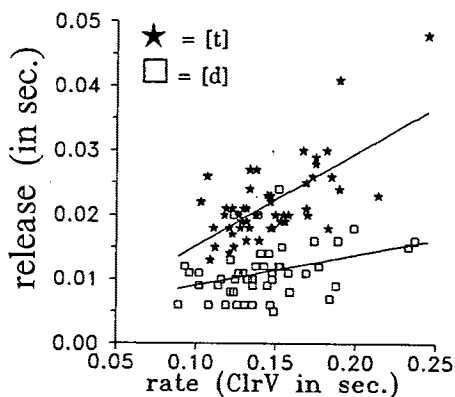


Fig. 1. -- Release duration for [t] and [d] measured in seconds across changes in rate. Cl = consonant closure gap, r = consonant release, V = vocalic resonance. 4 French speakers.

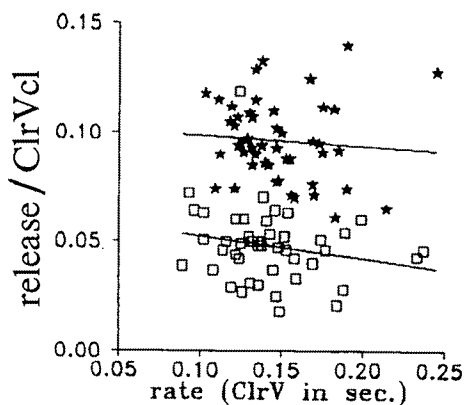


Fig. 2. -- Release duration for [t] and [d] measured relative to the duration of a ClrVcl - syllable. Cl = consonant closure gap, r = consonant release, V = vocalic resonance. 4 French speakers.

not tend to maintain separate distributions? Part of the answer came from reports that subjects perceive timing details by reference to syllables. In fact, when one ceases to view speech as a sequence of phonemes, and measures timing details by reference to or relative to the syllable, one does find, as illustrated in Figure 2, separate distributions capable of supporting distinctive features. Note that the framework of distinctive features in this case is not a phoneme-size segment but a syllable-size unit (details in Boucher, 1988).

As I have submitted elsewhere (Boucher, 1988, 1990), syllables and the feature-specific patterns just mentioned are the signature of a peripheral mechanism of speech production. As for claims that there are separate "phonetic" and "phonological" syllables, such a dichotomy was originally proposed (Pike, 1943) on the basis that speakers of different languages perceive varying numbers of syllables, as in the case of a Japanese who may claim six syllables for the word *democratic*. The reason is that Japanese *produce* the word with six open syllables, one vowel after every consonant, because that is the pattern of articulation to which they are accustomed (Catford, 1982). This hardly warrants the postulate of separate phonetic units and cognitive entities. If it does, then what would be the *cognitive* function of syllables?²

As a final example, consider rhythmic units called breath groups, defined as an utterance bordered by pauses for inspiration (cf., e.g., Lyons, 1977; Lieberman, 1967). Linguists afford little attention to such groups preferring instead the concept of sentence and the pragmatic notion of "utterance". Definitions of the latter remain fluid: "a sentence is an abstract entity defined within a theory of grammar, while an utterance is the issuance of a sentence [...] in an actual context" (Levinson, 1983, p. 18). In practice, linguists resort to intuitive criteria of grammatical and propositional completeness to segment such units. However, it has been reported that graduate students in linguistics have intuitions about sentences which differ from those of non-linguist graduate students (Labov, 1972, p. 199n). It is one thing for linguists to bring notions of sentences and utterances to bear on performance; it is quite another to suppose that these are the actual units of linguistic processing. Sentence boundaries, for instance, do not always contain phonetic markers. How, then, do children or naive listeners acquire a knowledge of these units? On the other hand, breath-groups frequently end at the boundaries of minor or major syntactic constituents. They also constitute natural intonational units. For instance, in producing a declarative unemphatic sentence, there is a progressive loss of subglottal pressure causing fundamental frequency to fall until inspiration is triggered (by a reflex mechanism reacting to an increase of CO₂ in the blood; see Gelfer et al. 1983). In this way, each breath group has its intonational contour. But one gets the impression from certain linguistic theories that prosodic units are the result of cognitive grammars (e.g. Selkirk, 1984). On this point, consider Figure 3a and 3b showing the mean length of utterances (breath groups), in syllables and morphemes, produced by subjects in different age groups. Now compare with Figure 4 which gives

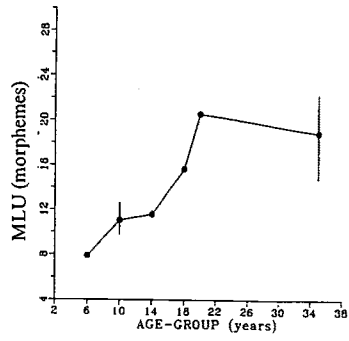


Fig. 3a. -- Mean Length of Utterance (in morphemes) by age-group. The vertical bars represent the range of values for an age-group.

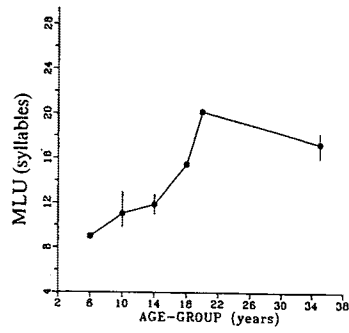


Fig. 3b. -- Mean Length of Utterance in (syllables) by age-group. The vertical bars represent the range of values for an age-group.

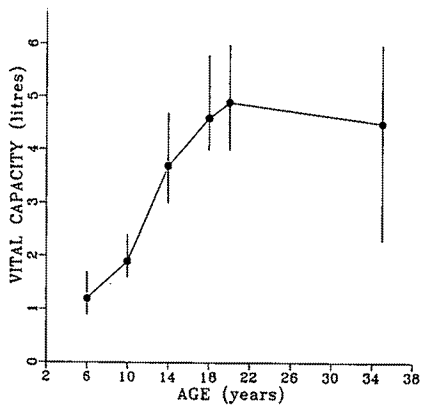


Fig. 4. -- VITAL CAPACITY (a proportion of TOTAL LUNG VOLUME) by age. Data from Spector (1956). The vertical bars represent the range of values for an age-group.

estimates of a measure of lung volume (vital capacity) for a population of the same age groups as those of Figure 3 (for details, see Boucher & Heisler, 1992). The similar slopes suggest that utterances are restricted in their length by properties of the breathing apparatus. If the view is that cognitive grammars or pragmatic knowledge are the determinants of utterances, then why is there this relationship between breathing capacities and utterance length? It would seem more realistic to suppose that abstract grammars and structures of "meaning" arise and develop in conformity with constraints on the activity of speech.

The central conclusion is that the rhythmic units presented above are not the product of sociolinguistic acquisition or cognitive processing. No one learns from interacting with others that speech is to be structured in syllables, in stress groups, and in breath groups, and no one's "mind" commands that it be so structured. Yet these are the configurations with which children are confronted and by which features, semantic units, and serial organization may arise. On the other hand, despite the counter-evidence of studies on analphabets, some maintain the position that alphabet-related concepts of linguistics represent universal constructs. From the fact that these constructs have no known correlates in speech, such positions lead to dubious dichotomies between speech and language, and to accounts of a language capacity "in the mind" defying known principles of biological evolution. It also invites the unwelcome suggestion that children have a genetic predisposition to recognize the given units of alphabet-writing cultures. My purpose has been to show that other perspectives may provide more tenable explanations of the development of language.

Footnotes

1. It has been a favored argument amongst certain historical linguists that the morphology of some languages naturally leads to an awareness of phoneme segments. However, it is not at all clear that this supports the hypothesis of phonemes as constructs emerging without the support of visual symbols. That is, one must keep clear the distinction between 1) an awareness of segments in heard utterances which arises from a putative cognitive predisposition, and 2) an awareness of segments which arises through some experience with visual signs representing speech. The problem is that certain historical linguists make claims concerning the former notion of awareness on the basis of data which apply to the latter notion. For instance, some claim that the special morphological conditions of Egyptian led to the invention of segmental signs to disambiguate written forms which were homophonous (Mattingly, 1992; Hodge, personal communication, among others). Yet this does not provide support for the claim of a predisposition to become aware of phonemes in *heard* utterances. It is not difficult to imagine that the Egyptian signs in question were invented precisely because written forms were

seen to be insufficient: in other words, signs were added which could represent a feature or a group of features (whether or not these represented separate phoneme-like bundles as in alphabet systems is not clear) but these additions were motivated by considerations of the design of existing graphic symbols and not exclusively by reference to heard signals. On the fundamental question of whether or not phoneme awareness can develop without reference to visual symbols, current findings appear onesided: when one eliminates a reference to visual signs, as in numerous tests involving alphabets and illiterates, there is no support for an awareness of phonemes or "feature bundles" in heard speech.

2. As the phonologist Basbøll commented, "I do not think it makes much sense to speak of syllables and syllabification at very abstract levels of representation" (1981, p. 258).

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A CONTEXT CHANGE MODEL OF FEEDBACK ACTS^{*}

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1 Introduction

When acting on the environment, agents need to perceive the effects of actions to be able to plan continuations. This is true for interactive action as well, in which another agent is part of the environment. Direct or indirect signs of effects can be used. We can maintain a 'receiver-defined' view of *feedback* as those data an agent *uses* as indicative of effects. A responding actor recognising the needs of an other agent may also *send* data as feedback. An integration of these two sides of feedback is the essence of full *communicative* feedback. When receivers use precisely those signals as feedback that responding agents send, we can speak of a 'conventional' feedback system².

In human communication *linguistic feedback* refers to utterances that function as signals on properties of interpretive processing. The most relevant properties of an interpretive subprocess are the mental state changes that take place during analysis of new information. Feedback signals can hence originate at various levels of analysis, and types of feedback associated with perception, understanding and evaluation have been recognised in linguistic literature (Allwood, Nivre and Ahlsen 1992). It is likely that as many types exist as there are submodules in an interpretive system.

Some types of feedback acts can perhaps fruitfully be viewed as originating as *side effects* of updates of the information state related with an interpretive subprocess. For instance, feedback at the level of utterance interpretation can be modelled as a side effect of updating the information state involved - in speech act theory the latter is often called the 'context model'. This means that feedback is triggered by a dialogue control process when interpretive rules, such as those deriving communicative function from expression type, are fired,

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²'Agent' or 'actor' refers to subjects of behaviour in general. We will use 'sender' and 'receiver' to refer to the agent giving or receiving feedback. Note that an actor next becomes feedback receiver. Human-system interaction in general does not meet the given definition of communicative feedback, think of the engine noise you want to hear when you start your car, which was never intended to be a part of your interaction with it, i.e. it cannot be considered interactive competence. This at the same time points to the critical role of the capacity to recognise or predict another agent's feedback needs. Dogs don't give feedback; on the other hand, car *designers* can recognise feedback needs and build desired functionality into a car.

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or fail to be fired³.

The essence of the present proposal thus is that, where 'normal' communicative acts are motivated by 'static' aspects of the context model, feedback acts are triggered by context *change*. Whether dynamic preconditions actually lead to utterances depends on perceived needs on the part of the previous speaker, and on expression principles derived from the hierarchy of feedback types, as we will see below. As part of the ordering of feedback types, we will discuss the highest feedback level as determined by the propositional attitudes of belief and intention, and propose that feedback on intentional aspects ('desirability') is in fact the high end of the feedback scale.

Before we can set out to associate interpretation and generation of acts of feedback to context-change theories of speech acts, we must first take a more careful look at conversational and cognitivist bases for a theory of feedback, for in the study of feedback generation and interpretation these two fields meet. In fact we will find backing for a conversational typology from cognitive science.

2 Feedback as a communicative category

Linguistic feedback has recently been identified as a subtype of *dialogue management* functionality (Allwood et al. 1992⁴). Dialogue management functions enable continuation of conversation by other means than those usually explained in a purely speech act theoretical (i.e., essentially Gricean) way. While the latter perspective focuses on the information transfer properties of communication (speech act theory is somewhat preoccupied with semantic content) and prescribe what standards such transfer should meet, dialogue management functionality concentrates on *procedural* aspects of communication. Such aspects are establishing or suspending contact, openings, resumptions and closings of exchanges, how to take, keep or give turns, how to introduce or end topics, but also when and how to send messages on processing of previous conversation, and on mental states. Hence, cognitively, dialogue management functions are perhaps best viewed as performed from the meta-level and triggered by a process *monitoring* the effects of communicative action.

³In fact it will mean that a monitoring process records conditions that may cause feedback, and passes them to the context model.

⁴All further references to Allwood et al. are to this paper. We will use 'dialogue management' in a general sense including 'dialogue control acts' and feedback. 'Dialogue control' (Bunt 1989) will be used in a more narrow sense as referring to a subtype of dialogue management functions regulating conversation as a conventionally structured event, and to the associated tokens. Dialogue management has been related before to several levels of analysis (e.g., Bunt et al. 1981). Allwood et al. to my knowledge for the first time clearly define feedback as the relevant subtype.

Many specialised feedback and control acts are available. In the words of Edmondson (1981), normal communicative acts are "cemented into the discourse" by such acts as 'uptakers' and 'appealers' ('interactional acts' as he termed them). Such utterances have been studied from linguistic and cognitive perspectives. Often a 'conversational' linguistic approach to dialogue management phenomena is taken which is syntactic in spirit, e.g. in terms of combinatorial concepts such as *adjacency* and *exchange structure* (e.g. Schegloff 1972a, Clark and Shaefer 1989). In such a view often no distinction is made between functionality for management of dialogue as a conventionally structured event, and signals on cognitive process.

In cognitive and computational approaches dialogue management functionality is often associated with 'repair', that is with what to do when normal flow of a dialogue is disrupted, but it should be stressed that this is a distorted picture, too much rooted on the correctness notion that comes with syntactic views of dialogue, as I have argued elsewhere (Bego 1991). Dialogue management is ever present, without it there is no dialogue. With regard to feedback, inappropriate or absent feedback invariably leads to cumbersome communication⁵.

Probably the first linguist to take a non-syntactic point of view and associating certain utterances to cognitive processing was Heritage (1984). He saw what we now call linguistic feedback as basically concerning signals on processing of previous parts of conversation, especially of the previous communicative act. The following is a part of a telephone conversation that will indicate the sort of acts involved:⁶

- A1: [Asks B whether a certain person is on board an incoming flight]
 B1: "Nee, dat is niet na te gaan, omdat passagierslijsten die blijven in New York en die zijn geheim" (*"No, I can't check that, because passenger lists stay in New York and they are classified."*)
 A2: "O" (*"Oh"*)
 B2: "Dus het is nooit te checken" (*"So it can never be checked"*)
 A3: "Goed" (*"Good"*)
 B3: "Ja?" (*"Yes?"*)
 A4: "Ja, bedankt hoor" (*"Yes, thanks"*)

Several utterances in this conversation pertain to mental process or to the dialogue itself, rather than to the domain of conversation (flight arrivals). From a cognitivist perspective such acts as "O" in A2 function as mental state change signals reporting that new information is processed and recorded. This

⁵The next phase is irritation, as every Unix user knows.

⁶From a corpus of Dutch telephone dialogues collected by IPO Eindhoven. English translation is given in Italics.

is what Heritage had in mind in calling such utterances 'change-of-state tokens', and it is what we now call feedback. Utterances A3, B3 and A4 are dialogue control acts, aimed at procedural organisation of the dialogue itself as an event. "Goed" in A3 accepts and closes a previous exchange, although it is ambiguous as to the extent of the exchange accepted, hence B3: "Ja?" is a prompt for continuation, and A4 more clearly initiates closing the dialogue as a whole.

State change signals such as A2 are not feedback in themselves however. In essence, they are mere signals of processing. They are feedback acts (or better, they *function* as feedback to a receiver) only if the state change occurred because of communication rather than mere observation, or retrieval from memory⁷. In the following example of the use of Heritage's 'state change token' "Oh" the new information state resulted from observation and memory (from Heritage; A saw somebody wearing a teeshirt):

A: "Oh, that teeshirt reminded me ... [tells story]" (2)

"Oh" here is a signal of ongoing processing (observation, memory access and retrieval, and, more importantly, it is sent as a signal of floor taking, i.e. it is dialogue control in a specific sense⁸. The feedback concept should be restricted to communicative acts triggered by changes resulting from communication, and it must not be stretched to cover what is in fact control (such as turn taking signals). We should not consider this use of "Oh" as feedback therefore. On the other hand, we must be careful not to define a reaction as feedback if it was triggered by change resulting *directly* from communication, for then we run the risk of having to call any response to any communicative act feedback. The following examples will clarify this⁹. In (3) an answer is given to a yes-no question:

A: "Is it raining?" (3)

B: "Yeah"

In (4) an assertion is made:

A: "It is raining" (4)

B: "Yeah"

⁷Only if the state change was not caused by input from 'cognitive peripherals', so to speak. But note that observation of *symbolic* behavior *is* communicative in this sense. We will further discuss this issue below.

⁸Note that here, as in feedback, we should distinguish the *prime cause* of the utterance (a state change) and its *use* (here floor taking), controlled by the 'dialogue management process'.

⁹Taken from Allwood et al.

In (3) B's response can be explained using the standard Gricean cooperativity principles. It is triggered by B's recognition of A's intention to know about (B's evaluation of) the proposition "it rains". B knows that A wants to know whether (B thinks that) it rains, and, in speech act theoretical terms, this is sufficient as a precondition for a yes-no answer. This answer is a direct response for which we do not need the concept of feedback¹⁰. But the answer does *imply* feedback, to the extent that it makes clear that B's processing of A's question succeeded. Most significantly, it implies that the preconditional *intention* was recognised, but furthermore it implies success at all levels down to the lowest¹¹. All actions performed as 'proper responses' imply feedback, and are in a sense communicatively *stronger* than feedback¹².

B's response in (4) is feedback. Such explicit feedback tokens become important especially when the true response is not observable, such as is the case with belief states after assertions¹³. Consider the next example, slightly adapted from an overheard interaction:

- A1: "It seems to be raining" (5)
 B1: [silent]
 A2: "Well?"
 B2: "Hmmm"
 A3: "Ok"

B1 is considered insufficient by A, but B2 is accepted. Gricean cooperativity nor its descendant, speech act theory, clearly conceive of responses to an assertion (if there is no relevant indirect interpretation). As Allwood et al. argue, we need principles of 'interactive communication management' to explain reactions in (4) and (5). Foremost among these is the principle that hearers should *report on evaluation* of the *evocative dimension* of communicative acts. For the basic types of communicative acts, i.e., statements, questions, and requests the contents of the evocative dimension are (intentions towards) *shared judgement, providing information and performing the requested action*, respectively (cf. Sadock 1990 for a similar analysis). But in this definition too, it seems that B's answer in (3) does not constitute explicit feedback: the *report on the achievement* of the evoked intention to provide information is *implicit* in the answer, which itself is the proper 'Gricean' outcome of such an intention.

¹⁰Contrary to what Allwood et al. assume.

¹¹Below I will call this aspect of feedback 'illocutionary'.

¹²The answer to a question is such a true ('proper' or 'direct') response. Likewise, if I close the door upon your request to do so, the true response, the closing itself, is not feedback. It is not in itself a token of any type 'feedback act', and it is not *sent by me as such*, but it implies all levels of feedback. By analogy, a proper answer is like the running of the engine in the car example above, which was the intended effect of turning the key.

¹³Thus contradicting the opinion that primarily negative feedback is important.

We concentrate here on *how* such signals as in (4) are generated, i.e. at what point in the cognitive process they originate. An idea explored in the present paper, in speech act theoretical terms, is that understanding by B of A in (4) does not generate the preconditions for B's act directly. It is the 'dialogue manager', a process monitoring the interpretation and generation of communicative action, that records a state change signal from one of its subprocesses (a positive, neutral or negative signal, coupled to the content of the utterance analysed), and translates this into a precondition for a feedback act, reported to the context model¹⁴. In this sense such signals are side-effects of context-change. This model of feedback generation extends one based on a purely speech act theoretical model in that chaining of contexts using rules for speech act interpretation is augmented by signals returned by context update functions. To summarise the difference, the following are three schematic pictures of the process of speech act chaining according to the 'context change theory of speech acts'. The circles represent belief sets, the arrows represent the transitions caused by communicative acts¹⁵:

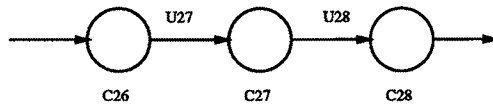


Figure 1: Contexts chained by utterances

In this simplified 'dialogue-space traversal' view just data are represented, agents are not distinguished, and utterances mediate state changes. The belief sets C_x are in fact a merge of the beliefs of agents. Shared beliefs are an important part of this. A more precise picture is one in which contexts are distinguished for each agent:

Contexts $A13$ and $B13$ and utterances $A12$, $A13$ and $B13$ are associated with agents A and B here. The twisted arrows represent the context changes caused by an incoming utterance (the control process realising the change by applying interpretive rules is not shown). This picture needs revision again if we want to include feedback signals on the cognitive processing of utterances:

¹⁴Reported *back* to the context model, if it concerns context-change feedback. Note that only context-change feedback is feedback in this internal sense. In general feedback will have to be immediate. If it isn't immediate, it has to be identifiable as related to the communicative act that caused the state change. I describe the standard process and the conceived feedback generation in terms of speech act preconditions and update rules elsewhere.

¹⁵In this and following figures solid arrows, labeled 'U..' or 'A..', represent utterances, where 'A13' refers to utterance 13 by speaker A . Circles represent states (contexts), grey twisted arrows represent state changes, straight dotted arrows represent feedback dataflow. Small boxes are procedures, a large box labeled 'A' represents the part of the process belonging one agent A . Main processes such as inferential mechanisms are left out.

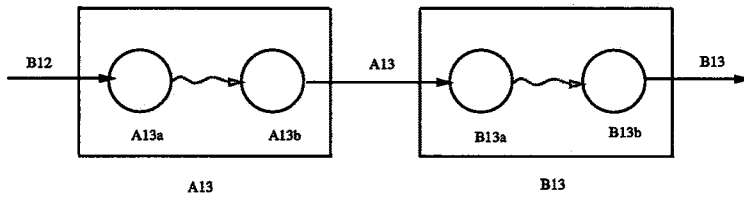


Figure 2: Agent-internal context change

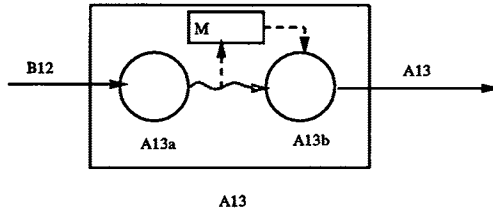


Figure 3: Agent-internal feedback signals in response to B12, monitored and reported to context model A13b.

In this slightly more process-oriented picture the process labeled 'M' monitors the triggering of rules for recognition of communicative acts and inference rules such as 'belief transfer' (see below). Context A13b gives rise to communicative feedback, in that a feedback act may now be triggered (but it may still remain implicit, depending on expression principles and perceived receiver needs). Note that this is feedback in the *sender-defined sense*¹⁶. At the same time these figures say nothing yet on feedback interpretation.

To gain a more clear and precise picture of feedback generation and interpretation, and in particular to be able to assess ordering and implicitness principles, we will next examine the knowledge sources feedback originates in and relate feedback types to system modularity.

3 Modularity and types of feedback

Feedback acts then, are a subtype of dialogue management functions, next to other subtypes that regulate turntaking and sequencing, which we have called 'dialogue control acts' above. Allwood et al. (1992) distinguish feedback mechanisms related to processes of contact maintenance, perception, understanding,

¹⁶Although we should distinguish two stages: a. the side-effect, i.e. the monitoring of changing context, and b. the decision to report it. The latter decision marks feedback as sender-defined in the indicated sense, in that the receiver's needs are recognised.

and functions related to such 'other attitudinal reactions' as acceptance and rejection.

This typology (if we disregard contact maintenance) partly matches the classical modular make-up of the linguistic process in subprocesses of perception, syntactic and semantic analysis, and pragmatic interpretation. This make-up is related to models of language production and analysis from cognitive science such as Fodor (1983). We will use Fodor's terminology in distinguishing *peripheral* and *central* processes. A typical peripheral process is auditory perception. Central processes are those that rely on inferential capacities to achieve interpretations, and are viewed as *symbolic* and *representational*. Processes are modular and thought of as *informationally encapsulated*, in that their subprocesses and data are inaccessible to other modules. In terms of a notion coined by Pylyshyn (1980), peripheral processes in particular are *impenetrable* by the central process.

Obviously, then, the feedback typology above is more than just superficially related to modularity. It for instance seems reasonable to assume a default ordering of feedback types that derives from a hierarchical ordering of modules in the system, such that pragmatic understanding implies semantic understanding which implies syntactic recognition which implies perception, as I have reported elsewhere (Bego 1992a)¹⁷. At the same time, Allwood et al.'s definition of feedback as indicative of *willingness* next to ability to perceive, understand, etc., seems questionable. There seems hardly any *will* involved in an impenetrable process such as syntactic recognition.

If we want to adhere closely to existing modular views of mental make-up, and base the feedback types on it, we should recognise roughly the following subprocesses and data: sensory input, phoneme recognition, lexical analysis, syntactic and semantic analysis, and contextual understanding of intentions, i.e., pragmatic understanding. The pragmatic level of analysis can (and should, if we hold on to speech act theory) be subdivided into illocutionary and perlocutionary levels¹⁸. In terms of knowledge sources, illocutionary understanding, i.e., recognition of speech acts, uses speech act rules (direct, and 'conventional' indirect). Perlocutionary understanding of 'non-conventional' indirect speech acts uses domain related knowledge (such as plan recognition). We can then perhaps in general distinguish higher or 'central state change' types of feedback from lower or 'peripheral' ones. Heritage (1984) in his arti-

¹⁷Cf. Edmondson (1981:84) who suggests such implications to explain the optionality of uptakers. The ordering seems to be partly justifiable inasmuch as a sequential (time) order exists on the stages of analysis, which is an undecided issue in psycholinguistics. Of course, as Nivre (1992) and Allwood (1992) note, the *polarity* of feedback interferes with such implications. We will get back to the issue of implied feedback below.

¹⁸In fact the existence of acts of illocutionary feedback can provide an empirical basis for speech act theory.

cle on 'change-of-state tokens' concentrates on what we can then conceive of as 'central state change feedback'.¹⁹

Note that feedback acts, although they are triggered as side effects by update functions, have to be processed (lead to utterances, and be recognised) like ordinary communicative acts (so that we can e.g. have feedback on feedback), therefore they must 'have a data representation' as Bunt&Allwood (1992:3) note. In the context model, that is. Feedback gets triggered by the update function (i.e., the interface) of a module (c.q. the module's database²⁰), it is recorded and channelled by the control process, and gets represented in the context model, leading to communicative acts in the normal way²¹.

3.1 Dimensions of context-change feedback

The typology by Allwood et al. seems to be somewhat too unspecific to fit the modularity picture of central processing as encompassing the highest levels of interpretation, to wit semantic and illocutionary interpretation, plus indirect interpretation using conventional communicative and domain dependent inference rules²². E.g. 'understanding' feedback seems a somewhat coarse category, and we must ask: what module is this, the 'understanding' process? We have to define contextual understanding e.g. as goal recognition, and then view this recognition as using the mentioned specific knowledge sources. Then a reallocation of feedback types of 'understanding' and 'other attitudinal reactions' to semantic, illocutionary and perlocutionary feedback may seem appropriate.

The illocutionary level of interpretation is the initial epistemic and intentional contextual level of analysis if we take a speech act theoretical perspective. It is here that propositional attitudes of belief and intention are attached to lower levels of interpretation (semantic, syntactic, surface properties) in a manner governed by conventions. Recall that speech acts are often defined as actions in a plan based approach, and attitudes are explicitly defined as preconditions. The paradigmatic form of such definitions is

$$\{C_1, \dots, C_n\} \Rightarrow do(A, CF(A, B, P))$$

¹⁹We might use the impenetrability notion to justify treating 'peripheral' types of feedback (signals from below the impenetrability divide) in a deeper sense as side effects, physically caused below the level of the Pylyshyn's 'virtual machine'.

²⁰For the purpose of modeling we can conceive of all modules as databases with rule-based interfaces.

²¹Note that *composition* of communicative functions into executable complex communicative act also has to take place. Acts so construed have a lot in common with Edmondson's (1981) notion of an interactional *move* composed of feedback acts plus head-acts.

²²Conventional communicative rules are e.g. needed for the indirect interpretation of "I need an X" as "Help me get an X".

where the antecedent $\{C_1, \dots, C_n\}$ is a set of conditions on performance of the consequent, written as $do(A, CF(A, B, P))$ which intends to denote the performance of action $CF(A, B, P)$ by speaker A to addressee B with communicative function CF and semantic content P ²³. Attitudes can be viewed as attached to surface features, which leads to the inclusion of such features in the definitions (e.g. Beun 1989). If this illocutionary level of speech acts as packages of attitudes attached to surface features and semantic content is indeed a distinguishable level of interpretation, we may associate feedback acts to it. We of course find utterances like B , which may be conceived of as giving explicit negative feedback at the illocutionary level:

A: "You drive" (6)

B: "Is that a question?"

Part of this illocutionary level is a computation of speaker and hearer effects upon recognition of the preconditions (as e.g. proposed by Bunt 1989). This level is a half way house between illocutionary and perlocutionary stages of analysis, and it consists of rules to the effect that the hearer knows that the preconditions of the recognised communicative act hold, and that the speaker knows that the hearer knows this (and, ideally, that this is mutually known). More truly 'perlocutionary' is the change brought about as the effect of the principle of *belief transfer*, a rule that states that if A believes that B believes that P holds, then, in the absence of evidence to the contrary, A comes to believe P herself.

Such illocutionary and perlocutionary effects of assertions do not constitute a *direct* force to respond²⁴. E.g. the uptake signals by a hearer during a sequence of informs in a prolonged turn by a speaker are instances of perlocutionary feedback (although ambiguous between neutral and positive on belief). B 's "Yeah" response in (4) is an example as well, perlocutionary neutral feedback "I know that it rains" implying a positive hearer-effect "I know that you want me to know that it rains", but neutral on belief transfer²⁵. Such perlocutionary neutral feedback ('no news' feedback), implies 'positive hearer-effect' at the next level down. Ordering principles, briefly discussed below, in fact default-imply positive feedback at all lower levels.

²³Here *do* is a constant, (meta-) variables are upper case.

²⁴Although, in Allwood's view, a special cooperativity principle obliges to a report of the evaluation at the evocative dimension (consent, here), the question is whether this should be 'built into' the speech acts as precondition, or be regulated at the meta-level via general rules.

²⁵This is a common pattern: upon an assertion perlocutionary consistency feedback (positive or neutral) is given but the turn is not taken. The question then is: which function is primary here and which is derived, the feedback or the prompting? Perhaps the idea of *multifunctionality* can help us out here (cf. Allwood 1992).

Feedback, then, is first of all associated with state changes that affect knowledge. The *extent* of a change can be reported as a 'news value' measure (a term by Heritage; equivalent to 'surprise' in Allwood's article, related to uses of 'expectancy' elsewhere). But feedback should be associated to the attitude of *intention* as well, for state changes often affect an agent's goals. The extent of any change can be reported as a value on an 'intentionality' or 'desirability' scale.

Allwood et al. mention additional attitudinal reactions such as 'regret', 'surprise', and 'enthusiasm'. These are termed emotional reactions, but because of their close association to the basic propositional attitudes of knowing and intending, such reactions should perhaps be considered derivative of these, as evaluations at *rational* cognitive dimensions. The emotional 'load' is secondary. Indeed Allwood's 'other attitudinal reactions' can be phrased entirely in terms of knowledge, say as 'expectancy', and intention, say as 'desirability'. If we have three values for each (positive, neutral and negative) we can represent some typical feedback reactions as positive, neutral or negative scores on both scales²⁶. Of course these reactions are ordered to the extent that a positive evaluation on desirability implies positive belief transfer. 'Desirability' is the high end of the hierarchy of feedback types.

It seems, then, that we get news value and desirability (expectancy and intentionality) as main dimensions of what I termed 'perlocutionary feedback' above. But the analysis is probably slightly specific to assertions. On questions and requests we tend to get reactions that point to unfulfilled preconditions having to do with 'ability' wrt. knowledge and physical conditions. The highest feedback level here probably should be characterised in terms of 'possibility' as a third modality next to knowledge and intention. Of course such an analysis has to be clarified through definitions of the knowledge sources involved (rules and data, update functions)²⁷.

Obviously implicative relations exist between proper responses and feedback, and between feedback dimensions. Proper responses imply positive feedback at most levels of feedback²⁸. The general principle further is that positive feedback on higher interpretive levels implies positive feedback at lower levels. Positive feedback on desirability, for instance, implies positive feedback on all other levels of processing. Conversely, negative feedback at lower levels implies

²⁶At the level of attitudes, we need at least the three values +, 0 and -, to be able to, in the case of knowledge, represent consistent new information, consistent non-news, and inconsistent new information. The first value will signal a normal 'perlocutionary' state change. Note that feedback can also be *undefined*.

²⁷And note that the dimension values need not necessarily correspond to attitude operators of different 'strength' such as weak or strong belief, but can be thought of as measures of support (justifications and goal relationships).

²⁸At least for direct assertions and requests. Indirect requests are less simple; a 'no' answer would seem to imply positive feedback to the direct act, and negative at the intentional level to the request.

non-positive feedback (negative or neutral) at all higher levels.

4 Conclusion

The sender-defined side of feedback deals with generation of feedback in two stages, i.e. its triggering as a monitored state change, and its uttering based on perceived receiver needs. A receiver-defined notion of feedback centers on data the receiver uses to evaluate effects; it needs feedback analysis rules that derive such information from an incoming utterance. The schematic picture has to be extended again to incorporate such interpretative functionality. In particular, we have to represent the receiver-context in a slightly more complex way. In figure 4, the process labeled 'F' analyses the incoming utterance B12 into a feedback act (dotted output) and a 'main message' (Allwood's term, solid).

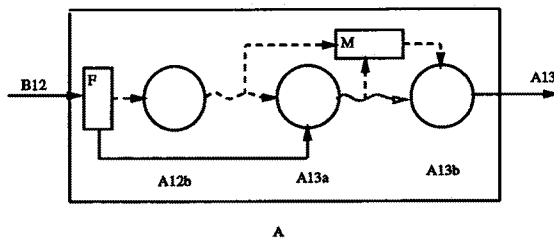


Figure 4: Feedback interpretation added to figure 3. A12b is the context before utterance B12.

A12b is the A-context saved from the previous turn. Note that the feedback data is interpreted in a different context than the main message! We can now in principle generate feedback on interpretation of feedback (the incoming dotted line in M). If only the feedback is responded to, A13a is the final context at this point. Note thirdly that the picture is too simple in that process F has to *test* A12b to be able to analyse B12 into feedback and main message.

Finally, the relations between uptake-like notions (termed 'interactional acts' by Edmondson) and moves that are feedback-like such as 'agreement' would seem to be in need of clarification, then. Note that for Edmondson the predisposition to respond positively to a request is not intrinsic to the *uptake* of the request as a valid move. Agreement as a move is a somewhat problematic notion, in that a positive state change in reaction to a request first of all predisposes to the requested act, not to a *report of the realisation of the predisposition*. If such a meta-move is to follow it has to be triggered by independent principles, as in fact argued above. Agreement, although a move (a major type of unit) in conversationalists terms, is feedback on the acquiring

of the positive predisposition (the change-of-state). Note then that feedback as viewed by Allwood et al. is a notion intermediate between uptake (which seems more like an illocutionary category) and agreement as a move²⁹.

A more precise analysis will probably show that the distinction depends on the definitions of the communicative acts, and on additional interpretive rules that are to realise the preconditions for the requested act.

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²⁹ A similar point is at stake with regard to B's utterance in (3) above. Viewing "yeah" as feedback here (as Allwood et al. do) here means not considering it as caused by (cooperative response to) the new state following acceptance of the question, and disregarding its major status as a communicative unit.

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THIS, THAT AND THE OTHER THING: SPATIAL REPRESENTATION IN THE ENGLISH DEMONSTRATIVES AND THE THIRD PERSON SINGULAR INANIMATE PRONOUN

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1. THE PROBLEM

This preliminary study of the demonstratives and the third person singular inanimate pronoun was inspired by a rather fortuitous combination of factors. Doctoral research into the system of gender in English personal pronouns revealed that 'it', 'this' and 'that' sometimes enter into a curious complementary relationship in possessive suppletive uses. For example, "*this one's*" and "*that one's*" are used in place of the very awkward sounding "*its*" (ex. *I like that/this one's [colour]* as opposed to the questionable *?I like its*). Teaching problems encountered in various English as a Second Language (E.S.L.) classrooms also focussed attention on the nature of the relationship of the demonstratives and 'it'. My university students—for the most part native French-speakers who are training to become E.S.L. teachers—tend to misuse the three pronouns. Even those who are extremely competent speakers of English will occasionally say or write "That's cold" for "It's cold" or "That's funny ..." where "It's funny ..." would have been more appropriate. These errors prove particularly challenging to deal with because they rarely result in ungrammatical utterances and even more rarely still lend themselves to easy explanations. My goal in undertaking this study was therefore twofold: to sort out the uses of 'it', 'this' and 'that' in order to better my understanding of the systems of which these pronouns are integral parts, and to come up with a teachable explanation which non-native speakers of English could in turn use in their own E.S.L. classrooms when working with primary and secondary students.

Many linguists have spent a good deal of time wondering about the system formed by 'this' and 'that'² and a number of others have considered 'it' in detail³. However, the closeness of 'it' and the two demonstratives has attracted little attention in spite of the fact that it constitutes a major problem in both translation and E.S.L. courses. As a consequence, the problem of 'it', 'this' and 'that' is not only "under-analyzed", but extremely difficult to tackle because the existing literature on the subject is highly heterogeneous and often difficult to blend into a coherent whole. Bits and pieces must be collected from various linguistic schools and then cobbled together in makeshift fashion, often with little scientific gain. Rather than engaging in such complex cobbling here, it might be more profitable to engage instead in a direct study of a number of simple examples which allow for an

¹ This tendency amongst French Canadian students is to overuse 'that' at the expense of 'it'. 'This' is less frequently misused, a point worthy of further investigation.

² This group of linguists includes, among others, André Joly and Thomas Fraser "Le système de la déixis I" and "Le système de la déixis II" in *Modèles linguistiques*, Lille: PUL, 1979-1980 and Laurent Danon-Boileau, author of "This, that, which, what et la construction de référence," *Travaux du CIEREC XXXIX, Méthodes en linguistique anglaise*, Université de Saint-Etienne, 1983, "That is the question," in Gressillon, A. and Lebrave, J.L. eds., *La langue au ras du texte*. Lille: PUL, 1984 and *Enonciations et référence*. Paris: Orphys, 1987.

³ Dwight Bolinger's chapter on 'it' in *Meaning and Form* is a particularly fine example.

examination of the expressive effects obtained with the three pronouns.

2. THE EVIDENCE

Consider the following rather banal examples:

- (1a) It's George.
- (1b) This is George.
- (1c) That is George.

In (1a) the third person singular inanimate pronoun would seem to play an essentially identifying role, equating the person named with the presence uppermost in the speaker's mind at the moment of speech. 'It' would not normally be used to pick out George in a crowd or to distinguish him from others in a pointed manner. This may be attributable to the inherent singularity of 'it', a pronoun which—unlike 'this' and 'that' or 'he' and 'she'—does not stand in opposition to a comparable yet opposite alternative pronominal choice and does not therefore require any division of the space in which it is given mental representation. In (1b) and (1c) on the other hand, we have more sophisticated spatial representations than the bare-bones identification of (1a). The space George is perceived to occupy (e.g. the space defined by 'this') is mentally set apart from another space which he could potentially occupy (e.g. the space defined by 'that'). In other words, as we shift from 'it' to 'this' and 'that', we move from the homogeneous, undivided expanse defined by 'it', to a space in which the "here and now" of the conversational locus is opposed to the "there and then" of everything situated outside of the conversational locus.

In the second series of examples, the pronouns are now used as complements but certain similarities with the first series can nonetheless be detected:

- (2a) Let me think about it.
- (2b) Let me think about that.
- (2c) Let me think about this.

Sentence (2a) would again seem to be the most "neutral" of the three. It leaves us with the impression that the speaker will simply study an idea or solution which has been put forward. Nothing suggests where the speaker stands with respect to the proposal and nothing tells us whether the idea with be accepted or rejected; we only know that it will be considered. In (2b) and (2c), on the other hand, we are left with the impression that other alternatives have either already been considered or are still to come. By opening up an alternative space which stands in opposition to the space filled by the notion currently under consideration, the demonstrative pronouns set up situations in which other possibilities are implicitly evoked. For example, 'that'—the demonstrative which serves to distance what it evokes from the speaker's sphere of interest by situating it outside of the conversational locus—suggests that the speaker is probably not very keen on the suggestion being offered and is consequently leaving room for an alternative proposal which has already been suggested or is yet to come. When 'this'—the demonstrative which draws what is being talked about into the speaker's sphere of interest and hence into the conversational locus—is used, one is left with the feeling that the speaker finds the proposal more attractive than another previously put forward.

In the examples considered thus far, the expressive effects obtained differ in

relatively subtle ways and capturing the differences in words is not an easy task. In many respects, the next series of examples offers a better handhold on the problem as the gap between the various expressive effects widens considerably:

- (3a) It's cold.
- (3b) That's cold.
- (3c) This is cold.

With no additional context, sentence (3a) leads us to think first and foremost of the atmospheric conditions prevailing at the moment of speech, the ambient conditions engulfing the speaker and constituting his immediate reality. In contrast, (3b) et (3c) tend to bring to mind precise objects—for example, a container taken from a freezer or a frozen bit of metal—or temperatures which distinguish themselves from others by being particularly cold. For instance, it's possible to say, "Forty-two below. Boy, that's cold!", when we wish to indicate that there is something about minus 42°C that is worthy of attention. When 'this' is used, there is also a certain focussing on a particular temperature that is not present with 'it'. For instance, walking about outside on a particularly cold day, one could say, "Now, this is cold!" and the listener would understand that the temperature on this particular day stands out with respect to other, less frigid temperatures. Had 'it' been used rather than either 'that' or 'this', the nuance of implicit comparison of one particular temperature with other temperatures would have been lost. Thus, we once again find that the demonstratives play a particularizing, contrastive role which sets one set of impressions off against another comparable, yet different, set. In contrast, 'it' has no such alternative evoking ability. The third person singular personal pronoun brings to mind a single set of impressions without any implicit or explicit evocation of another possibility.

Sentences (4) to (7) are unlike (1) to (3) in that they do not allow for the same easy pronominal commutation. While 'it' is acceptable in any of them, the substitution of either 'this' or 'that' results in a sentence which is rather questionable, if not downright unacceptable. The question that now must be answered is why this is so.

- (4) It seems to me he's right.
- (5) It's time to go.
- (6) He is brownbagging it.
- (7) Coke is it!

In the very limited number of examples considered thus far, 'it' has been seen to play the role of a generalizer, evoking things which require only minimal characterization and which are in no manner contrasted with alternative possibilities. The demonstratives, on the other hand, have been seen to play a particularizing role, opposing one set of impressions to another or suggesting that there is room for an alternative evocation. If this postulate is correct, we should be able to find something in examples (4) to (7)—examples which are very awkward with a demonstrative pronoun—that is not conducive to such particularization and contrasting.

It is hard to determine precisely what the pronoun in (4) evokes. One might speculate that it is the situation or state of affairs under discussion at the moment of speech, but it is difficult to pin down the referent with any exactitude. It is perhaps

partially for this reason that neither of the demonstratives would be an acceptable substitute for the third person singular pronoun *here*. The referent is clearly of a very general nature, corresponding roughly to the speaker's complete set of impressions of a situation. Any division of representational space would undermine the speaker's effort to represent impressions that cover the totality of a situation. In short, the speaker's aim in (4) is to talk about all of the various impressions associated with a given situation. The use of either *'this'* or *'that'* would have resulted in an unwanted effect of particularization. Similarly, the *'it'* in (5) evokes the "here and now" of the speaker, the moment in time which is sufficiently defined by the speaker's presence in it and which needs no contrasting with another moment in time. In fact, the use of *'that'* in (5) leads to the exclusion of the present moment while the use of *'this'* leaves an impression of redundancy in its wake by explicitly situating the moment of speech within the conversational locus, a locus which is by definition the "here and now" of the speaker.

Example (6) is similar to (4) and (5) in that the very general nature of the referent dramatically reduces the possibility of finding a particularizing division of representational space. Once again, it is almost impossible to say exactly what referent is evoked by *'it'*. The use of either demonstrative would evoke a specific referent which the subject has taken to toting about in a brown bag. With the third person singular pronoun, however, the focus is not on the object being carried, but rather on the carrying process. This effect can only be achieved through the complete generalization—indeed, dematerialization—of *'it'*. Any division of representational space would counteract the desired generalizing tendency.

The final example is perhaps the clearest when it comes to illustrating how *'it'* is used when the speaker has no intention of comparing his referent to another or of leaving room for an alternative possibility. In (7), an advertising slogan for Coca Cola, the goal is to present Coke as the ultimate in softdrinks, as a brand beyond compare. In order to create a form of synonymy between the brand Coke and the concept softdrink, advertisers wisely decided to use *'it'*, the pronoun of generalization. Had they chosen either *'this'* or *'that'*, the impact of the ad would have been rather disastrous. Rather than see Coke as the softdrink, consumers would have expected a list of ingredients or a detailed explanation of what Coca Cola was to follow. Other advertisers have since capitalized on the generalizing, non-alternative evoking third person singular pronoun. Nike, for instance, has come up with the slogan "Just do it!", in which *'it'* evokes the entire range of activities that the athlete is capable of dreaming up. In contrast, the use of either *'this'* or *'that'* in the ad would have placed considerable restraints on the range of undertakings the consumer was invited to imagine because it would have led to the automatic division of the mental space used in the speaker's evocation.

3. 'IT', 'THAT' AND 'SHE'

When one begins to compare and contrast the demonstratives and the third person singular inanimate personal pronoun in terms of representational space, an interesting parallel can be drawn between *'this'*, *'that'* and some uses of *'she'*. On the basis of the evidence presented thus far, it would seem that the pronoun *'it'* differs from the demonstratives in that it evokes an inherently singular, homogeneous spatial representation while *'this'* and *'that'* evoke divided, and hence contrastive, space. In the course of doctoral research on the system of gender in English, it was found that the animate third person singular pronouns are used in

conditions somewhat similar to those in which the demonstratives are found⁴. What is of particular interest here is the fact that the feminine pronoun 'she', like 'this' and 'that' can frequently be found to alternate with 'it' (e.g. *Fill it up!!/Fill 'er up!; It's blowing up a storm./She's blowing up a storm.*) These observations raise the question of parallels between the animate third person singular personal pronoun and the demonstratives. Clearly all four pronouns share an inherent underlying dual spatial representation. It now remains to be seen what else these representations have in common and how they differ. Work has already begun on this problem, but the investigation is far from over.

4. CONCLUSIONS

Although it would be premature to draw any firm conclusions about the uses of 'it', 'this' and 'that' on the basis of the limited research conducted thus far, it would seem that using representational space as a common denominator and as a teaching tool might prove valuable. If non-native speaking students are taught to view 'this' and 'that' as pronouns of contrast (divided representational space) and 'it' as the pronoun of simple evocation (homogeneous, undivided representational space), the number of errors they make using the three pronouns might diminish. A much refined version of this type of explanation should be ready for classroom teaching in the near future and the results obtained therewith will certainly suggest new directions for research.

⁴ See Morris, L. (1991). *Gender in Contemporary English: the System and Its Uses*. Doctoral dissertation: Université Laval.

II

GENERAL LINGUISTICS

COMPLEMENTARITY BETWEEN FORMALISM AND FUNCTIONALISM IN LINGUISTIC THEORY: EVIDENCE FROM THE SYNTAX OF MODERN STANDARD ARABIC

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O. Introduction

Current linguistic theory reveals a continuing rivalry between two long-standing philosophies in linguistics--formalism and functionalism. These philosophies encompass quite a few theories, each with its own goals and beliefs. The differences in goals and beliefs exist and divide linguists into two separate groups. This state of general fragmentation among linguists nowadays is not new. As pointed out by Sullivan (1985), the conference on contemporary models of syntax (which was sponsored by the Linguistics Department of the University of Wisconsin at Milwaukee in 1979) showed a considerable amount of disagreement and lack of understanding of others' theories among linguists. This paper stems from my belief that such a state of fragmentation should not exist. Instead, I propose that both formal and functional paths should be taken simultaneously.

The major goal of this paper is to argue that formalism and functionalism need not be incompatible. Indeed, they are complementary. An adequate linguistic analysis is one which accommodates the principles of both formal and functional approaches simultaneously. Evidence from Modern Standard Arabic (hereafter MSA) is given to support this assertion. It is generally argued that neither grammatical principles alone nor discourse-based principles alone suffice to analyze the syntactic structure of MSA.

Data from MSA and English are used to discuss anaphoric coreference and ellipsis. It will be shown that in cases where simple sentences are involved, the formalist binding principle seems to hold very well, perhaps more so in English than in MSA. In more complex cases it is demonstrated that native speakers rely more on pragmatic strategies than on formal structure for the interpretation of anaphoric coreference and the recoverability of missing material.

1. Anaphoric Binding in MSA

There are two approaches to the study of anaphora in the current literature on natural language. One studies the constraints on anaphora in discourse. Here, anaphora involving 'coreference' is to be studied outside the grammar (Reinhart 1983). Under this approach the role of 'coreference' in describing anaphora is not restricted. The other approach is

primarily sentence-level theory and is exemplified by the Binding Principles of Government and Binding theory (Chomsky 1981). This theory attempts to describe anaphora in terms of configurational notions such as C-command and governing category. Under this approach the role of 'coreference' is very much restricted where all anaphora is represented in the grammar. While there is some overlap in the concerns of the two approaches, neither of them seems to account for the full range of anaphoric phenomena. Therefore I will argue that there is no clear characterization of which anaphoric conditions or constraints are dependent on sentence-internal configuration and which are best described in terms of structure of discourse.

Now let us consider anaphoric binding in MSA. Consider the following sentences.

- (1) *šaʔara zayd-un_i bi -ʔal- ʔdab-i yaʔlu fi-nafsihi_i*
 felt Zayd-nom with-the-anger-gen rise in-himself
 'Zayd felt the anger rise in himself'
- (2) *ʔaʔbara zayd-un_i suʔad-an ʔala ʔal-ʔamal-i li- nafsihi_i*
 forced Zayd-nom Suad-acc to the-work -gen for-himself
 'Zayd forced Suad to work for himself'
- (3) *šahada zayd-un_i ʔal-mubarat-a fi-bayt -i -hi_i*
 saw Zayd-nom the-game -acc in-house-gen-his
 'Zayd saw the game at his house.'
- (4) *ʔaḥabbat ʔal-umm -u_i ʔan yaʔkula ʔal -walad-u*
 liked the-mother-nom to eat the-boy -nom

taʔam-a -ha_i
 food -acc-her
 'The mother liked the boy to eat her food'

Notice that the distribution of the reflexives in the sentences above does not follow from principle A of the Binding Theory. In such cases, a reflexive is permitted where a pronoun would be expected. Observe that in all of the examples, the anaphor is within a PP in the lower VP.

A quick look at the examples in (1) through (4) might suggest that the prepositional phrase allows this 'non-local' binding to take place. However, notice that this can not be the case, as the following examples illustrate.

- (5) *samiʔa zayd-un_i ʔaḥmad-an yataḥaddaθ-u maʔa-hu_i*
 heard Zayd-nom Ahmad-acc speak -nom with-him
 'Zayd heard Ahmad speak with him'
- (6) *raʔaa zayd-un_i zawʔat-a -hu ḥazinat-an ʔalay-hi_i*
 saw Zayd-nom wife -acc-his sad -acc about-him
 'Zayd saw his wife sad about him'

The structure of these sentences requires pronominalization rather than reflexivization. Any attempt to state the condition on opacity strictly in terms of PP versus NP structure seems unlikely.

The principles of θ -Theory can provide an account for this phenomenon. The sentences above are structurally identical, but thematically they are different. Observe that the PPs in (5) and (6) take objects which participate in the thematic structure of the verb. In these sentences, the verbs select the prepositions which take NPs that function as objects of the verb. On the other hand, the PPs in (1) through (4) differ in that the PP is functioning as a modifier of the VP. The objects of the prepositions in these sentences are not thematically associated with the verb. One could suggest a functional rule of Thematic Restructuring. Formally, this rule has the effect of making an object of a preposition an object of the verb. (This rule is similar to Stowell's Syntactic Reanalysis Rule (Stowell 1981)). This rule makes it possible to distinguish the structures in (5) and (6) from the ones in (1) through (4) in terms of the thematic properties of the verb.

Although the basic principles of the Binding Theory are valid at least for English, a number of problems can be solved by reconsidering the role of indices in semantic interpretation. MSA provides substantial evidence for that. In the following examples, each sentence poses a problem for the interpretation generally assumed of the randomly assigned indices. In other words, that the coindexed NPs are coreferential while the non-coindexed NPs are not.

- (7) 'akala ?aliyy-un wa 'ahmad-un ?ašaa -'a -huma
ate Ali -nom and Ahmad-nom dinner-acc-their
'Ali and Ahmad ate their dinner'
- (8) 'i?taqada zayd-un 'anna-hu mariiḍ-un wa ?aliyy-un 'ayḍan
thought Zayd-nom that -he sich -nom and Ali -nom too
'Zayd thought that he was sich and Ali did too'
- (9)
- (a) šawwata zayd-un li -nafs-i -hi faqat
voted Zayd-nom for-self-gen-him only
'Only Zayd voted for himself'
- (b) šawwata zayd-un li -zayd-in faqat
voted Zayd-nom for-Zayd-gen only
'Only Zayd voted for Zayd'

In (7) the relationship between the indices of each proper noun and that of the cojoined NP they form is a problem. Neither NP is coreferential with the whole conjoined NP nor with 'their'. So they must be assigned different indices. Also, they are not

'disjoint' in reference. In (8) this sentence is similar to what Reinhart (1983), following Ross (1967), called 'sloppy identity'. 'Ali may think he himself was sick' is the sloppy reading. The non-sloppy reading is that 'Ali may think that Zayd was sick'. Given that *he* (pronoun) in the first sentence may take Zayd as the antecedent in either reading, we must have a way of indexing the pronoun which allows each reading of the second clause after the VP has been copied. In the third example, sentence (9b) seems acceptable with the two instances of 'Zayd' coreferential. This violates Principle C of the Binding Theory (Chomsky 1981). Notice that (9a) has different contextual truth condition from (9b). For example, in a situation where many people voted Zayd, (a) could be true but not (b).

In developing a solution for such a problem, I propose that the role of indices in semantic interpretation should be indirect. Coindexation assigned on the basis of S-structure configurations of the type discussed in Chomsky 1981 has no inherent semantic value. It only serves as a guide in the mapping from that representation onto a discourse representation (Roberts 1985). The principles of Binding Theory are no longer viewed as constraints on the grammaticality of representations. Their effects, however, are to be maintained through constraints on co-indexation. A number of problems will be solved if we do this. Co-indexation constrains the mapping from S-structures to discourse representation. A number of the problematic examples which cannot be explained by the present Binding Theory can be accounted for in terms of discourse constraints, hence, the complementarity between formalism and functionalism in linguistic theory. The joined constraints of the Binding and discourse theories could very well account for the full range of anaphoric phenomena in natural language.

2. Ellipsis in MSA

The following elliptical constructions can be identified in MSA, among others.

(10) Gapping

yaqra'u zayd-un 'al-ši'r -a
reads Zayd-nom the-poetry-acc
'Zayd reads poetry,

wa ['aḥmad-un ____ 'al-naθr -a]
and Ahmad -nom the-prose-acc
and [Ahmad ____ prose.]'

(11) Stripping

(a) 'a?taa 'aḥmad-un kutub-an li-zayd-in
gave Ahmad -nom books-acc to-Zayd-gen
'Ahmad gave books to Zayd,

wa [ʔaliyy-un ____] 'aydan
and Ali -nom too
and [Ali ____] too.'

- (b) 'aʔtaa 'ahmad-un kutub-an li-zayd-in
gave Ahmad-nom books-acc to-Zayd-gen
'Ahmad gave books to Zayd,

wa [____ 'aqlaam-an ____] 'aydan
and pens -acc too
and [____ pens ____] too.'

(12) VP Ellipsis (VPE), Sluicing

- (a) ʔaadara zayd-un bilamsi
left Zayd-nom yesterday
'Zayd left yesterday,

wa ahmad-un [____] 'aydan
and Ahmad-nom too
and Ahmad [____] too.'

- (b) 'aʔtaa 'ahmad-un ʃay -'an li-zayd-in
gave Ahmad-nom thing-acc to-Zayd-gen
'Ahmad gave something to Zayd,

laakinni la 'aʔlam-u maadāa [____]
but neg knew -nom what
but I don't know what [____].'

The sentences in (10 through (12) are not complete since their function-argument requirements are not satisfied. In these elliptical constructions, the elements which are considered to be required for a complete sentence are missing. For example, in the Gapping construction in (1), the verbal head *yaqra'u* is missing from the second conjunct. In the Stripping constructions in (11), the verbal head is missing along with the other elements. In the VPE and Sluicing constructions in (12), the VP and S constituents are missing.

The heads of the elliptical clauses (hereafter e-clauses) play a central role in the definition of e-constructions. The head may be verbal, as in (10); adjectival, as in (13); and possibly nominal, as in (14) below.

- (13) 'ahmad-un muʔram-un bi-'umm -i -hi
Ahmad -nom fond -nom of-mother-gen-his
'Ahmad is fond of his mother,

wa [ʔaliyy-un ____ bi-'uʔt -i -hi]
and Ali -nom of-sister-gen-his
and [Ali ____ of his sister].'

- (14) zayd-un muhandis-un fi makkah
 Zayd-nom engineer-nom in Makkah
 'Zayd is an engineer in Makkah,

wa [ʔaliyy-un ____ fi 'al-riyaad]
 and Ali -nom in Riyadh
 and [Ali ____ in Riyadh].'

An e-clause is defined by a 'projection' on the syntactic tree, consisting of the predicate and its dominating verbal and clausal categories.

The e-correspondents in e-clauses must be major constituents as described in Hankamer (1973). Major constituents are arguments, complements or adjuncts of the missing heads of their projections. One can think of major constituents as the immediate daughters of the head projections involved in the ellipsis.

The acceptability of (15) is due to the fact that the correspondents are syntactic realizations of the subject and the complement of the missing head *taḥaddaθa* 'spoke'. The ungrammaticality of (16) is caused by the fact that *Zayd* is not a major constituent, not being the syntactic realization of the subject.

- (15) taḥaddaθa 'aḥmad-un maʔa ʔaliyy-in
 spoke Ahmad-nom with Ali -gen
 'Ahmad spoke with Ali,

wa [saʔd -un ____ maʔa zayd-in]
 and Saʔad-nom with Zayd-gen
 and [Saʔad ____ with Zayd].'

- (16) *taḥaddaθa 'aḥmad-un maʔa ʔaliyy-in
 spoke Ahmad-nom with Ali -gen
 *'Ahmad spoke with Ali,

wa [saʔd -un ____ zayd-in]
 and Saʔad-nom Zayd-gen
 and [Saʔad ____ Zayd].'

In what follows, I will investigate the Recoverability of the missing elements in the e-clauses in MSA.

3. Recoverability

Information provided by the e-correspondents and the antecedent clause is the basis for recovering the missing material in e-clauses. Generally speaking, recoverability implies the identify of antecedent and the elliptical material. As the examples [fond] and [are fond] in (17a), [loves sweets] and [love sweets] in

(17b), and [himself] and [herself] in (17c) show, the antecedent and the recovered item need not be phonologically identical.

- (17) (a) zayd-un muṣram-un bi-him
 Zayd-nom fond -nom of-them
 'Zayd is fond of them
- wa [hum ____ bi-hi]
 and [they ____ of-him]
 and they of him.'
- (b) yuḥib-u zayd-un 'al-ḥalwa
 loves-nom Zayd-nom the-sweets
 'Zayd loves sweets,
- wa ['al-'atfaal -u ____] 'ayḍan
 and [the -children-nom ____] too
 and the children too.'
- (c) yuḥawil-u zayd-un 'an yuṭawwir-a
 try -nom Zayd-nom to advance -acc
 'Zayd tries to advance
- nafs-a -hu lakin [laysa maryam ____]
 self-acc-him but [not Mariam ____]
 himself, but not Mariam.'

A more 'global' notion of identify is quite different from the identity of the individual constituents that are recovered. It is assumed that every element in the antecedent clause that has no correspondent in the e-clause will be reconstructed as part of the interpretation of the e-clause. All arguments that are required by the head will be present in the interpreted e-clause. This suggests that the Θ -role assigning head may be recovered not only as a lexical item but as a lexical entry, complete with Θ -assigning properties and c-selections (subcategorization requirements). Stowell (1981) states "that the associated Θ -grid is recovered as well." If this is the case that the Θ -grid has been reconstructed, arguments may not be added to nor omitted in the interpretation of the e-clause from the a-clause. (18a) can not be read so that *writes* is interpreted as an intransitive and the gapping reading of (18b) is ungrammatical because *al-ṣi'ra* will not be interpreted as an argument of the head *writes*.

- (18) (a) yaktub-u zayd-un al -ṣi'r -a
 writes-nom Zayd-nom the-poetry-acc
 'Zayd writes poetry,
- wa [ʔaliyy-un ____] 'ayḍan
 and [Ali -nom ____] too
 and Ali too.'

- (b) *yaktub-u zayd-un
 write -nom Zayd-nom
 *'Zayd writes

wa [___ al -ši?r -a] 'ayḍan
 and [___ the-poetry-acc] too
 and poetry too.'

However, in contrast to arguments, adjuncts may be either added or omitted from reconstructed material. (19) has an adjunct that has been added as an e-correspondent and yet there is no a-correspondent in the antecedent clause.

- (19) yu ʕanni zayd-un
 sing Zayd-nom
 'Zayd sings,

wa [___ bi -ṭariiqat-in ḥasanat-in] 'ayḍan
 and [___ with-way -gen good -gen] too
 and [___ very well] too.'

The interpretation of the e-clause may have no adjunct even though an adjunct may be present in the antecedent clause. Example (20) shows how the interpretation of an adjunct may be optional.

- (20) (a) aʔta-t maryam 'al -zuhur -a li-zayd-in
 gave-fem Mariam the-flowers-acc to-Zayd-gen
 'Mariam gave flowers to Zayd

bi-al -ams -i wa [___ li-ʔaliyy-in] 'ayḍan
 in-the-yesterday-gen and [___ to-Ali -gen] too
 yesterday, and to Ali too.'

- (b) Well, yes, but the ones to Ali she really gave today.
 (c) Well, no, the ones to Ali she gave today.

As (20b) and (20c) show, acceptable discourse could continue in either way, both expressing the same information. If the e-clause recovered by the hearer is "Mariam gave flowers to Ali yesterday too", then (20c) is the expected response. The hearer knows the information to be incorrect. The hearer may indicate agreement with the proposition he takes to have been expressed by the e-clause in (20a) if he answers yes, as in (20b). The corresponding proposition can only have been "Mariam gave flowers to Ali yesterday too." The additional information that follows is taken as providing additional information, i.e. that the event took place today. I believe that "yes, but..." cannot be used to contradict information that has been previously asserted, as in (21).

- (21) (a) Mariam gave flowers yesterday.
 (b) Well, yes, but she really gave them today.
 (c) Well, no, she gave them today.

However, politeness studies have shown that in many cases the desire for solidarity leads to the use of 'positive politeness' strategies (Brown and Levinson 1987), some of which are strategies to avoid disagreement. Examples of this strategy include the use of "yes, but..." in order to appear to agree or to avoid disagreement rather than giving a blatant "No".

4. Concluding Remarks

In this paper, I tried to show that, despite the seemingly irreconcilable differences between them, formalism and functionalism need not be contradictory. Quite the opposite, these two philosophies seem to complement one another. The existing gulf between these two philosophies seems deep. However, the results obtained in this paper seem to suggest optimism. Although undoubtedly some advances have been made to bridge the gap between formalism and functionalism, there are so many open problems, so much vagueness, and so few crucial linguistic problems solved that modesty, if not sometimes skepticism, is warranted. The precise format (if any) of the complementarity between formalism and functionalism in linguistic theory, its specific domains and links, and its working procedures are still open to discussion and confusion. It is long past the time when linguists on both sides should have started putting differences aside and started listening to each other. Looking at the current state of affairs in linguistic theory, it seems that an adequate account of natural language is concomitant with the interaction of linguists on both sides. The key for obtaining complementarity between both sides lies in the interaction of parameterized rules (formalism) and working principles (functionalism.)

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A METHODOLOGICAL PITFALL OF GRAMMATICAL TERMINOLOGY

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In the introduction to a 1991 book entitled Tense in English, the author discredits the view that there are only two tenses in English based on the morphology of the verb. One of the main arguments put forward in rejecting this position is the following:

As to the observation that only the preterit is morphologically distinct from the present: what reason is there for taking precisely this characteristic as criterial? It is well known that it is often the case that one and the same idea is expressed morphologically in one language and by means of an independent morpheme in another. (...) Many languages use suffixes to express relations which are expressed by means of prepositions in English. Why should we not accept that some tenses can be expressed morphologically while others make use of free morphemes (auxiliaries)?

(Declerck 1991:9-10)

The author goes on to apply this line of reasoning to the so-called 'future' and 'present perfect' in English. With respect to the former and the view that will expresses modality rather than tense, it is claimed that 'there is no a priori reason why a verb form should be unable to express a temporal relation and a modal connection at the same time (in the same way as a verb form often expresses both a temporal relation and an aspectual meaning). (...) the French future tense... is as modal as its English counterpart, but its existence as a tense is less controversial because it involves an inflectional morpheme.' This leads the author to adopt the position that there are eight tenses in English: the present, the preterit, the present perfect, the past perfect, the conditional, the conditional perfect, the future and the future perfect.

These categories are nothing new: most of them go back to terms used by Latin grammarians (cf Michael 1970:116 ff.). If

Declerck were a medieval or Renaissance grammarian, he would be open to the very simple criticism that just because such tenses existed in Latin does not mean that they must necessarily exist in English. Declerck however is obviously not under the influence of the authority of Latin grammar as were his grammatical forbears. How then has he fallen into a similar trap by attributing un-English categories to the English language?

For his categories are un-English. They place inflectional forms such as ate on the same level as syntactic constructions such as will have eaten. By treating the past and present perfect as separate tenses, they ignore the morphological and semantic parallel between:

(1a) He has finished his pie.

(1b) He had finished his pie,

and the fact that whereas the notion of 'perfect' is transposable from the present to the past time-sphere, this is not true of her preterit or present categories, there being no 'past in the present' or 'present in the past'. Declerck's system also leaves aside the fact that the past tense of other modals than will can be used to express 'conditionality', as can be seen from:

(2a) We can lift it.

(2b) We could lift it (if we had a crowbar).

If would lift is a conditional tense, then why isn't the same status given to could lift?

As for the claim that will + infinitive is a future tense, this has at least two serious shortcomings. Firstly, it artificially separates will from the other English modals with which it fully shares the morphological and syntactic characteristics peculiar to this class of verbs (absence of the -s ending in the third person singular, construction with the bare infinitive). Second, an artificial division is also introduced between the future uses of will and those where it expresses volition, as in:

(3a) I'm trying everything, but he won't yield.

(3b) I tried everything, but he wouldn't yield.

It is noteworthy that in French grammars of English the above sentences are translated by means of the verb vouloir and not the French future tense, as can be seen in Cestre and Dubois' rendering of (3b) by:

- (4) Quoi que j'aie pu faire, il n'a pas voulu céder
(1970:270).

So much for the claim that the French future tense is just as modal as its 'English counterpart' will + infinitive.

What then has led to this applying of un-English categories to English grammar, to come back to the question asked above? I believe the culprit to be the term 'tense' itself. Such a term cries out for definition and definitions are often dogmatic. Declerck in this case subscribes to Lyons' (1977:68) and Fleischman's (1982:10) definitions of tense, which say that the latter 'grammaticalizes the relationship which holds between the time of the situation that is being described and the temporal zero-point of the deictic context' (Lyons) and is to be defined as 'a deictic category of grammar, marked formally by an affix, particle, auxiliary, etc., whose primary function is to mark sequence of events in direct or indirect relation to a temporal zero-point, which is the moment of the speech event' (Fleischman). Now this is 'tense' defined outside of the framework of any concrete language in such a general way as to be applicable to all human languages. As such, 'tense' is an idealization which only exists in the mind of the linguist – and even then only in the mind of those linguists who accept this particular definition!

The methodological question raised by this is: can such idealizations really explain actual language use? I hold they cannot. A scientific explanation of a phenomenon involves relating the phenomenon to the causes or conditions which brought it into being (sciences such as zoology which merely classify do not claim to explain). An idealization such as the notion of tense described above, however, does not stand in a causal relation to actual language usage in English at all, since it is the product of the imagination of a linguist generalizing from many different languages. What does hold a causal relation to a given use of an English verb form is the meaning of that verb form as possessed by a particular speaker of English. It is this therefore that we must strive to uncover if we are to explain how English is actually used – along with, of course, all the pragmatic factors which derive from the fact of having an intelligent being using the instrument for conceptualization and communication which the English language is.

We must be very prudent, therefore, with terminology. The latter should spring from careful examination of each individual language and not be posited a priori without respect for the way each language puts sign and significante into relation with one

another. Otherwise one can even end up lamenting the fact that no real language corresponds to one's analytical categories, as occurs in the following passage from Davidsen-Nielsen (1990:37) with respect to the category 'auxiliary' :

Obviously it would be analytically satisfactory if application of these criteria singled out exactly the same verbs [in English and Danish]. That this is not the case is due to the fact that we are dealing with natural, changing languages, in which there are verbs that have acquired some but not all of the properties of auxiliaries.

Can Davidsen-Nielsen's 'auxiliary' really be considered a linguistic category if no language has one?

Even such apparently straightforward terms as 'singular' and 'present' must be treated with caution. The use of the former term has recently induced one author (Reid 1991) to define the meaning of the zero morpheme on the English noun as 'one', a definition which leads him to claim, firstly, that with mass nouns 'the Entity Number meaning ONE is used faute de mieux to communicate a message for which it is not ideally suited' (p. 80) and, secondly, that two buffalo is a singular, ie it only evokes one buffalo. The term 'present' is applied to verb forms in practically every language which has come under the scrutiny of a linguist. This does not prevent the 'present' in two very closely-related languages such as English and German from behaving in very different ways, as can be seen from:

(5) Ich weiß das nur seit gestern.

(6) *I know that only since yesterday.

These cases further illustrate the point made above that the terms used by linguists to designate linguistic entities do not in themselves have explanatory power. What does have explanatory power is the significate attached to the sign of the English or German 'present' forms, or to the zero sign on the English noun, in the minds of the speakers of these languages. This consequently is what we linguists have to attempt to reconstruct, through the working of scientific imagination, if we are to lay any claim to explaining real usage.

In this respect, studies such as that of Korrel 1991 represent a step in the right direction. She proposes a semantic hypothesis as to the meaning of the 'present tense' which might explain the difference in usage observed in (5) and (6) above.

According to this hypothesis, English sees the present as a moment which is 'about to be occupied by the speaker's presence' whereas in German it is seen as being already occupied by the speaker's presence (pp. 121-122). This would explain why in German the present can be counted among the already realized instants of an event as in (5), while in English it cannot and we have to resort to a construction containing a past participle in order to evoke these already realized instants.

It is to be hoped therefore that linguists will be more careful in the future in the way they use terminology. Not only must we take care to define our terms, but we must also realize that if our definitions are to have any explanatory power they must be based on the reality of usage in a specific language and not on idealizations with but a tenuous connection to any particular idiom.

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III

PHONOLOGY

TOWARD A ONE-DIMENSIONAL SYLLABLE ANALYSIS

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Transition Tempo

In a recent article in *Lingua* (Griffen 1992), we find some curious phonologically pertinent changes in Swabian, a major collection of dialects in the Alemannic group of West Germanic. Under certain conditions, the Middle High German glide [w] changed to the consonant [b]; for example, Middle High German būwen [bu:wən] 'to build' is realized in Swabian as [baubə]. A parallel (but not as extensive) change was noted from the glide [j] to the consonant [g]; for example, Middle High German giligen [giljən] 'lily' is realized in Swabian as [ilgə].

Moreover, we find an opposite series of changes along the same parameter in the history of Celtic (see Griffen 1986). For example, the final consonant in Irish delb corresponds to a glide in Early Middle Welsh delw [delw] 'image' and then to a vowel by Late Middle Welsh delu [delu]. Likewise, the final consonant in Irish selg corresponds to a glide in Early Middle Welsh hely [helj] 'hunt' and then to a vowel by Late Middle Welsh hela [hela] (compare Evans 1964:10-11). These examples involve the full relationship among all three of the basic classes of sounds — consonant, glide, and vowel. (Unlike the changes in Swabian, however, these changes have not resulted in a restructuring of the phonological system and are thus not strictly phonologically pertinent.)

As pointed out in the Swabian article, this pattern of change cannot be accounted for from the traditional segmental approach, but it can be explained within the nonsegmental framework of dynamic phonetics and phonology. In this change, the dynamic nature of the syllable is crucial, for the difference among consonant, glide, and vowel in this pattern has nothing to do with independent segmentable entities themselves, but rests upon the dynamics with which they are articulated — their "transition tempos."

At the root of the concept of the transition tempo is a well-known phonetic experiment conducted almost four decades ago by Liberman et al. (1956). When the transition of the consonant [b] was lengthened (in effect, when it was slowed down relative to the rest of the utterance, shortening its tempo), it was perceived as a glide [w]; and when the transition of the glide [w] was lengthened, it was perceived as a vowel [u]. A parallel relationship was also found among the consonant [g], glide [j], and vowel [i].

As it were, the Swabian environment in which the glide [w] changes to a consonant [b] is demonstrably one in which the shortened transition would

be less marked. Thus, the traditional pattern of change from the (more) marked to the (more) unmarked is maintained (in the neutralizable opposition of Trubetzkoy 1969). Conversely, the Celtic environment involving consonant, glide, and vowel and producing the opposite changes within the same pattern is demonstrably more marked for the pertinent feature.

Thus, the feature of transition tempo is not simply an oddity of experimental phonetics, but it is a phonologically pertinent feature with a direct role in sound change. Moreover, this feature is so basic as to determine the difference between consonant, glide, and vowel: The shorter the transition tempo, the more consonant-like the sound is; the longer the transition tempo, the more vowel-like.

From an acoustic standpoint, of course, there is nothing fundamentally surprising about this relationship — this opposition along the transition tempo scale. After all, the vowel is characterized by a relatively steady-state formant pattern that can certainly be interpreted as a long “transition tempo.” As seen in the classic studies establishing the existence of the consonantal loci (Delattre et al. 1955), the locus of the consonant is not visible as a point on the spectrogram, but it must be extrapolated from the abrupt movement of formants to or from the steady-state pattern of the vowel. In effect, the movement between locus and vowel formants represents a short transition tempo.

When we take the phonologically pertinent feature of transition tempo together with the nature of the consonantal locus as a short deviation in the formant patterns of the vowel — a short transition — a disquieting conclusion starts to emerge. The combination of the recently developed dynamic phonology and the decades-old knowledge of acoustic phonetic transitions and loci clearly shows a break-down in the boundaries between the most basic classes of speech/language sound — consonants, glides, and vowels. The fundamental distinction among consonant, glide, and vowel is not one of quality, but one of quantity.

Syllabics and Nonsyllabics in Welsh

In the context of transition tempo, let us now consider the status of the nonsyllabics in Welsh. Written as the initial sequences *gwl-*, *gwr-*, and *gwn-*, these clusters have traditionally been analyzed as the voiced (unaspirated) dorsal stop released through the liquid or nasal and coarticulated with the labial glide. Within the dynamic syllabic frame, the word *gwlad* [gl^{wa}:d] ‘country, fatherland’ can be analyzed (greatly oversimplified) as in figure 1.

As early as Old Welsh, however, we find evidence of dialects in which the nonsyllabic glide [w] is realized as a syllabic vowel [u]. Even among those carefully using standard literary Modern Welsh, in which the nonsyllabic is obligatory, the glide can slip into the vowel. For example, an extended play phonograph record entitled *Pronouncing the Welsh Language* (Swansea:

Welsh Teldisc Records, n.d.) provides pronunciation lessons by “two of the best-known radio and TV artistes in Wales” (from the record jacket). Moreover, it was produced under the direction of the distinguished Welsh novelist Islwyn Ffowc Elis. In a recitation of the national anthem Hen Wlad fy Nhadau ‘[Old] Land of my Fathers’, the speaker slowly and clearly pronounces gwlad as disyllabic [gulad] (in the absence of the music in which it receives only a single note).

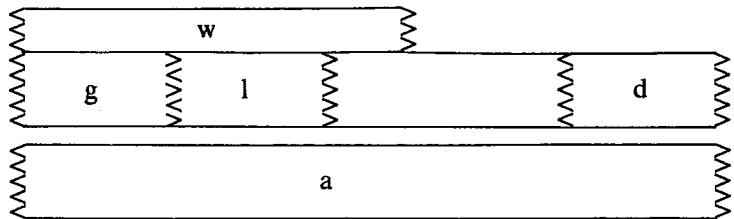


Figure 1: Monosyllabic realization of gwlad [gl^wa:d]

Given the nature of the difference between glide and vowel in the opposition of transition tempo, we should not be surprised that the syllabic pronunciation of the nonsyllabic occurs in slow and careful pronunciation in what should be an example of “good” Welsh. In slowing down his speech, the speaker in the recording slows down his tempo as well, lengthening the glide to a vowel. Within the dynamic syllabic frame, this new pronunciation can be represented as in figure 2.

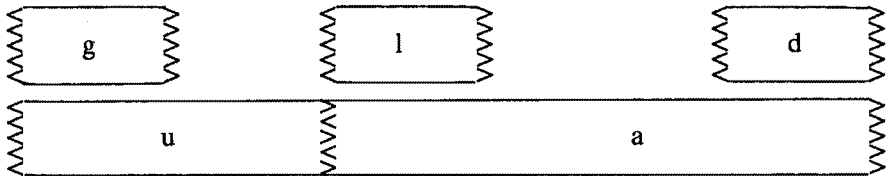


Figure 2: Disyllabic realization of gwlad [gulad]

Comparing the figures, we can see that what had been a cluster prosody — a constraining feature of the consonantal obstruction — is now a syllabic vowel. Thus, the transition tempo establishes an alternation between

a consonantal feature and a nuclear vowel!

Moreover, the alternation between consonantal feature and vowel is even more profound, for it affects the fundamental nature of the syllable itself. With a shorter transition tempo, the word is realized as a monosyllable with an initial cluster; while with a longer transition tempo, the word is realized as a disyllable. The distinction between a cluster and a syllable is thus also one of quantity, not of quality.

The One-Dimensional Syllable

From the acoustic phonetic standpoint, the differences along the opposition of transition tempo among consonant, glide, and vowel all have to do with the abruptness of the formant frequencies. If there is a relatively great movement of the formants from one set of values to another in a relatively short span of time, a consonant is perceived. If the movement is relatively less great and/or the span of time is relatively less short, a glide is perceived. If the movement is relatively small or if a single set of values is produced in a relatively long span of time, a vowel is perceived.

Given a perceived vowel — a relatively small movement of formant values or a single set over a relatively long span of time — a syllable is perceived. If, however, the movement between formant values becomes greater and/or the span of time grows shorter, then the status of the emission as vocalic — and thence as syllabic — is lost.

Insofar as we can speak of a tradition in dynamic phonology, then this phenomenon is certainly in keeping with the dynamic phonological tradition. The dynamic syllable has been defined, after all, as a steady-state vocalic emission (Griffen 1985:36-38); and this definition can certainly embrace the concept of a syllable that exists as something quantitatively durative.

Nor do the hierarchies of constraint and the syllabic frame contradict this new concept. The organization of features is in essence functional rather than structural. Indeed, that a basically laryngeal feature such as the opposition between whisper and voice could function within the syllable division (as in the voiceless vowel — compare Griffen 1983) or within the consonant division (as in the feature of aspiration) has been a hallmark of the model and a testimony to its structural flexibility all along.

What is at issue here goes beyond notational adjustments and to our very understanding of the syllable. The distinction between consonant and vowel, cluster and syllable has long been a given in phonology. Where segmental models (linear and nonlinear) have reduced the "sounds" to their phonematic placeholders in a string, these placeholders have been C's and V's in the tradition of Firth 1948, in nonlinear CV phonology as in Fudge 1987, and in metrical and autosegmental models such as in Goldsmith 1990.

Even in dynamic phonology with its structural flexibility, the organization of the syllable into the syllabic vowel constrained by consonantal

obstructions has been considered basic. Between the hierarchical order of divisions and its representation in the syllabic frame, the relationship between consonant and vowel could be visualized as occurring in two dimensions — one “horizontal” through time and one “vertical” of constraint.

Of course, the vertical dimension cannot be eliminated, for it must be used to accommodate the various types of “noise” that accompany obstruction; and for the phonology, it is at least insightful for the functional organization of the features. But if the fundamental difference between consonant and vowel, obstruction and syllable, is quantitative and a matter of time, then we must embark on a totally new approach to the analysis of the speech event. In order to gain a fuller understanding of the quantitative relationship among consonant, glide, and vowel, we must explore the formant patterns in a single dimension along time to see just how much of this relationship can be explained in that single dimension.

Of course, such an exploration goes far beyond this preliminary presentation. The conceptual demands upon the analyst, however, can be appreciated from the outset. In essence, we must attempt as full an accounting as possible for what were heretofore considered to be the major sound classes solely through quantitative variations in the flow of the acoustic pattern. This may be likened to mapping a stream according to its flow alone — without reference to any discernable landmarks along the bank.

It has taken years to conceptualize the totally nonsegmental organization of dynamic phonology and to purge (not quite completely!) the concept of cross-sectional segmentation from the analysis. Now, to reduce the basic concept of the consonant as a separable constraint on the vowel within the syllable to that of the dynamic coarticulation of differing degrees along the same scale should compound the problems of conceptualization as the image of speech sound moves ever further from the old orthographic symbols of the alphabet.

To what degree such an exploration may be directly incorporated into the model is at this point unclear. Given the phonological pertinence of transition tempo and its implications for the very existence of a differentiation among consonant, glide, and vowel and for the nature of the syllable itself, if we did not explore the possibilities, we would commit the same type of stubborn adherence to convenience and tradition that characterizes the approaches that choose to ignore the fullest evidence of dynamic phonetics and to avoid its fullest application.

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ESTONIAN LENGTH AND MORAIC ANALYSIS

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Introduction

Estonian is a Finnic language that is spoken mainly in Estonia (but also in other parts of the former Soviet Union) and is a part of the larger Finno-Ugric family. Globally there are about 1,100,000 speakers (Grimes 1988). There is a situation in Estonian that has been the topic of much discussion for many years, that of syllable quantity. There are three types of syllables whose quantities are, in part, determined by the length of the consonants and vowels contained therein. The notion of quantity in Estonian has been described in many different terms, including that of a moraic analysis (specifically in Hayes 1989). Unfortunately, the analyses presented don't adequately describe some of the more problematic forms. This paper will attempt to shed a little light on the discussion of quantity in Estonian.

Phonetics

The phonemes of Estonian are listed below. All the symbols used in this paper, except for the palatalized consonants, are the same as those found in the literature and are:

Consonants

Stops	p	t	t ^y	k	
Fricatives	f	s	s ^y	ʃ	h
Nasals	m	n	n ^y	(ŋ)	
Laterals		l	l ^y		
Trill		r			
Semivowels	v		j		

/p/, /t/, and /k/ are unaspirated, voiceless, and lenis. /f/ and /ʃ/ are generally only used in foreign words, as are the two phonemes /z/ and /ž/ which are only discussed in the dictionary (Saagpakk 1982) and are not included in this paper. /ŋ/ is an allophone of /n/ that occurs before the velar /k/. /j/ is the same as /y/, but /v/ is not like /w/. /v/ is voiceless in quantity 1 (see below), and is voiced in quantity 3. It is produced with "the lower lip...brought against the edge of the upper teeth" (Oinas 1966:3).

Vowels

	Front Unrounded	Front Rounded	Back Unrounded	Back Rounded
high	i	ü		u
mid	e	ö	õ	o
low	ä		a	

The symbols for the vowels are not strictly phonetic. For example, /e/ is pronounced more like [ɛ]. The mid-back unrounded vowel /õ/ is also articulated as a mid-central vowel.

Quantity

In order to avoid confusion with syllable quantity (discussed below), this paper will use the terms Quantity 1 (Q1), Quantity 2 (Q2), and Quantity 3 (Q3) after Lehiste (1966:1) when discussing phoneme length. Thus, "[o]n the segmental level, the term [Q1] applies to the short quantity of vowels and consonants; [Q2] refers to the quantity associated with long vowels and diphthongs and with long consonants, often called short geminates; and [Q3] designates the quantity of overlong vowels and diphthongs and of overlong consonants" (Lehiste, 1966:1). In Estonian, all of the phonemes except /v/ and /j/ can occur in one of these three grades of quantity. Oinas (1966:3) says that /v/ and /j/ only occur in Q1 and Q3, but offers no explanation. Raun and Saareste (1965:19) say that /v/ and /j/ don't have Q2 intersyllabically (just Q1 and Q3) and Lehiste (1966:1) only mentions that /v/ does not occur in all three quantities, but won't tell us in what quantities it does. Harms (1962) doesn't say anything at all about the issue. The dictionary (Saagpakk 1982) seems to imply that /v/ and /j/ don't act any differently than the other consonants. The issue remains unresolved.

Syllable Types

Harms (1962:35) describes the syllable "(S)" as being made up of "an optional onset (O) consisting of one or two consonants; a nucleus (N) made up of a single vowel, a vowel cluster or a vowel plus a consonant; and an optional coda (D) of one to three consonants." His definition includes a consonant in the nucleus because he places stress on some consonants, so that there is a difference between /rikkas/ 'rich' and /rikkas/ 'in a rich one'. One consequence of such a definition is that there would be two different ways to stress a single syllable. A speaker could stress either the vowel or the consonant of a Nucleus that contains both. This might be evidence that mora are stressed in Estonian. If so, Harms' syllable definition may be saying that syllables (N + C) contain up to 5 (or 6) mora! This problem will be discussed (in part) below. There are three types of syllables in Estonian, 'short', 'long', and 'overlong' (also called 'extra long' in the literature [e.g. Harms, 1962]). A syllable is made up no more than three mora.

Short Syllables

Short syllables end in a single short vowel, and can have any number of consonants for an onset (probably with a limit of three). According to Raun and Saareste (1965) a short syllable can also end in a short consonant (Q1) if the syllable is "non-first" (i.e. any word-medial or word-final syllable). Thus they include the final syllables (a dash is used to mark the syllable boundary) of /e-lan/ 'I live', /ar-mas-tat/ 'you love', and /kult-ti-ve-rip/ 'cultivates' in the short category. They do not include the second syllable of 'you love' in the short category because they say that the /s/ is not a short (Q1) but a long (Q2) consonant, which would make it /ar-mass-tat/. It is then interesting to note that all of their examples are also word-final. In terms of mora theory, a short syllable consists of a single mora and would be considered to be light.

Long Syllables

Long syllables end in a cluster of vowels (or a single Q2 vowel) or a single (Q1) consonant which follows a Q1 vowel (or a resonant followed by a consonant). Raun and Saareste also include "non-first" syllables that end in a long consonant or cluster of two short consonants in their definition. Once again their example (/sa-jant/ 'century') is also word-final. This leaves the reader wondering if they really

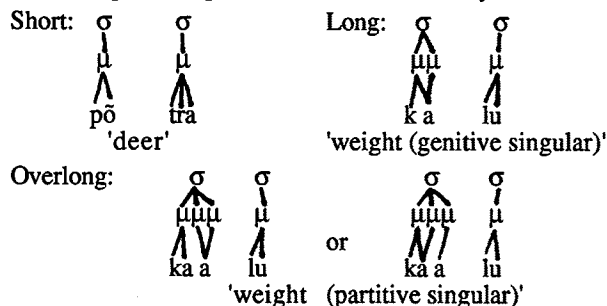
mean "non-first" or just word-final since they offer no other examples. Long syllables are made up of two mora and would be called heavy.

Overlong Syllables

Finally, overlong syllables end in an overlong (Q3) vowel or vowel sequence, or an overlong (Q3) consonant (or a cluster containing an overlong consonant). For Harms, an overlong syllable is one that ends in two or more consonants. He makes no mention of vowel quantity in his definition. Overlong syllables are comprised of three mora and could be considered to be superheavy.

Examples

Simple examples of words whose first syllable are of each length include:



Problems

This analysis works for most syllables, but there are problems. First, all single-syllable words are pronounced as overlong (in isolation), and as such, should be trimoraic. But in phrases, the monosyllabic words are pronounced at their usual length. The answer to this problem may lie in the rules for the formation of phrases, but it is beyond the scope of this paper. Next, words like /tsunft/ 'trade-guild', and /triikk/ 'ironing' are monosyllabic words that should be four mora long, and /paavst/ 'pope' five mora long. One solution for syllables of more than three mora, is to treat the word-final consonantal mora as extrasyllabic. This would not only take care of 'trade-guild' and 'ironing', but would also explain how a short syllable could end in a consonant if it is "non-first" (in this case word-final) as in 'I live', 'you love', 'cultivates', and 'century' (from above). Unfortunately, 'pope' is still a problem. It also may be that certain consonant clusters should be treated as a single moraic unit in codas, much like they are in onsets. The difficulty with this position lies in deciding which clusters get treated as monomoraic, and which are bimoraic. In 'pope', is the cluster /vs/ or /st/? Intuitively the latter makes more sense, but how can it be shown theoretically? Following the ideas presented in Hyman (1985), each phoneme would initially be assigned a mora:



Then syllabification would begin. Scanning left to right, the initial mora would not be associated with the syllable because it already is associated with a consonant (and onset consonants have no weight in syllables). That mora, now not a part of the structure, would be deleted and the initial /p/ re-associates with the new first mora:



Continuing to scan to the right, the syllable would keep associating mora until the limit of three is reached. At that point, if (consonantal) extrasyllabicity is allowed at the ends of words, the fourth mora could remain and the fifth mora would be deleted. Finally, the /t/ would re-associate with the fourth (extrasyllabic) mora:



It can now be seen that the monomoraic word-final clusters are a consequence of the process of syllabification, combined with (consonantal) extrasyllabicity. The representation of these clusters may still be a diacritic, but if it is, it is better motivated than having two extrasyllabic final mora.

Case

In Estonian, there are 14 different cases for nouns. They are Nominative [Nom.], Genitive (Accusative) [Gen.], Partitive [Prt.], Illative [Ill.], Inessive [Ine.], Elative [Ela.], Allative [All.], Adessive [Ads.], Ablative [Abl.], Translative [Trs.], Terminative [Trm.], Essive [Ess.], Abessive [Abe.], and Comitative [Com.]. All nouns are also marked for being either singular or plural. Except for the Nom., Gen., and Prt., most of the case forms are created by adding a case-marking suffix to the Gen. form (either singular or plural). The Nom. plural is formed by adding a suffix [-d/] to the Gen. singular, and the Gen. plural is (in general) formed by adding another suffix [-de/ or /-te/] to the Prt. singular. It is not clear how the Nom., Gen. and Prt. singular are formed; it is unclear which of the forms is more basic (i.e. which is the root from which the others are derived). The only thing that can be said with clarity is that the Nom. and Part. are of the same grade (see below), and that the Gen. (and all cases derived from it) is of the opposite grade. There are some nouns in which the Prt. and Ill. are the same form. All the cases for the word 'foot' are:

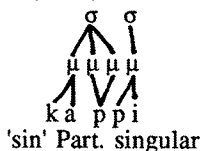
<u>CASE</u>	<u>SINGULAR</u>	<u>PLURAL</u>	<u>GLOSS</u>
Nominative	jal:k	jalat	'foot'
Genitive (Accusative)	jala	jal:kate	'of the foot'
Partitive	jal:ka	jal:ku	'foot'
Illative	jalasse or jal:ka	jal:katesse or jal:ku	'into the foot'
Inessive	jalas	jal:kates or jalus	'in the foot'
Elative	jalast	jal:katest or jalust	'out of the foot'
Allative	jalale	jal:katele or jalule	'to the foot'
Adessive	jalal	jal:katel or jalul	'at the foot'
Ablative	jalalt	jal:katelt or jalult	'from the foot'
Translative	jalaks	jal:kateks or jaluks	'to a foot'
Terminative	jalani	jal:kateni	'to the foot'
Essive	jalana	jal:katena	'as a foot'
Abessive	jalatta	jal:katetta	'without a foot'
Comitative	jalaka	jal:kateka	'with the foot'

Strong vs. Weak

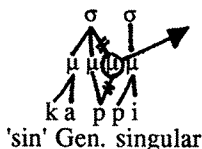
There are two grades of words, strong and weak, in the declension of some Estonian nouns (and the conjugation of some verbs - which will not be discussed here). The difference between the strong grade and the weak grade is in the quantity of either the vowels or the consonants in the word, and thus the length of the syllable. It shows up as an alternation between overlong elements (strong) and long elements (weak). The process is morphologically triggered, the lengthening (or shortening) of one element of the form of one case, which creates the form for a different case. It seems to involve the insertion or deletion of a single mora, which may imply that a mora can be a morpheme. The discussion of such an implication is beyond the scope of this paper. Prince (1980:538) lists the simple forms of some nouns in the strong and weak grades (I have omitted the verbs from this list, but their behavior is similar), which are:

<u>STRONG GRADE</u>	<u>WEAK GRADE</u>	<u>GLOSS</u>
pat:tu (Prt. sg.)	pattu (Gen. sg.)	'sin'
kap:pi (Prt. sg.)	kappi (Gen. sg.)	'cupboard, closet'
luk:ku (Prt. sg.)	lukku (Gen. sg.)	'lock'
lin:na (Prt. sg.)	linna (Gen. sg.)	'town'
tan:ki (Prt. sg.)	tanki (Gen. sg.)	'tongs'
sil:ma (Prt. sg.)	silma (Gen. sg.)	'eye'
lap:si (Prt. pl.)	lapse (Gen. sg.)	'child' (also strong when Part. sg.)
mak:su (Prt. sg.)	maksu (Gen. sg.)	'payment, tax'
kaa:lu (Prt. sg.)	kaalu (Gen. sg.)	'weight'
tei:se (Ill. sg.)	teise (Gen. sg.)	'other' (also strong when Part. sg.)

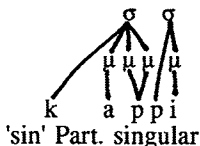
It seems that the Gen. singular is formed from the Part. by shortening the geminate consonant or vowel. But it is simply the deletion of the mora immediately preceding the last branching mora (onset), so that



becomes:



The deletion of the mora immediately preceding the last mora that has an onset provides an argument in favor of the notation system of Hyman (1985) over that of Hayes (1989). Under Hayes, the representation of 'sin' would look like



which would provide no clue as to what is deleted to form the Gen. singular. All the mora look alike, and there is no motivation to delete one mora over another. This implies that there is more than just a notational difference between Hyman and Hayes, and that Hyman's proposals are more representative of the actual mechanisms of language.

Disagreements

There are still a few alternations between the strong and weak grades that are problematic. The main difficulty lies in the orthography. A whole overlong syllable is marked for its extra length and not the consonant or vowel that makes it overlong. In the nouns in the preceding section there is no problem because there is no ambiguity as to which segment is long. The 'spelling' of the segments is clear. However, there are words in which the 'spelling' provides little information, and might also lead to the conclusion that both segments in the strong grade are overlong. Prince (1980:539) comes to this conclusion for 'boat', 'all', 'boy', and (twice in) 'beef-steak' the following table:

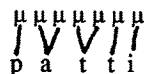
<u>STRONG GRADE</u>	<u>WEAK GRADE</u>	<u>GLOSS</u>
paat:ti (Ill. sg.)	paati (Gen. sg.)	'boat' (Ill. sg.= Part. sg.)
kōi:k:ke (Part. sg.)	kōike (Gen. sg.)	'all'
poi:s:si (Part. sg.)	poisi (Gen. sg.)	'boy'
tark:ka (Part. sg.)	tarka (Gen. sg.)	'wise'
kimp:pu (Part. sg.)	kimpu (Gen. sg.)	'bundle'
arkument:ti (Part. sg.)	arkumenti (Gen. sg.)	['argument']
bii:f:stee:k:ki (Part. sg.)	bii:f:steeki (Gen. sg.)	['beef-steak']

If Prince is correct, then the difference between the strong and weak grades is a matter of two mora being deleted, and not one. This would mean that these words are in a different class than those in the preceding section, and that there are two ways to derive the Gen. from the Part.. None of the authors in the literature express that this is the case. In addition, all of the data in the preceding section, as well as 'wise', 'bundle', and 'argument' in this section, seem to indicate that it is the consonant only that is of quantity 3, and not both the consonant and vowel. The spellings in the literature don't offer any clues as to what is really happening. Fortunately the dictionary (Saagpakk, 1982:xli) comes to the rescue with an example in its section on quantity. It says that "[a]fter a long vowel or a diphthong, *k, p, t, f, s,* or *ss* followed by a vowel or occurring at the end of a word is generally of the third duration [Q3] (the long vowel or diphthong preceding these consonants does not determine the duration)" [emphasis inside the parentheses added]. It then offers examples which include the word 'boy'. This means that in 'boat', 'all', 'boy', and (both times in) 'beef-steak' it is the consonant alone that is overlong, and not the vowel as Prince (erroneously) suggests. Therefore the strong grade of the immediately preceding examples is really like:

STRONG GRADE

paat:ti (Ill. sg.= Part. sg.)
 kōi:k:ke (Part. sg.)
 poi:s:si (Part. sg.)
 tark:ka (Part. sg.)
 kimp:pu (Part. sg.)
 arkument:ti (Part. sg.)
 biif:fsteek:ki (Part. sg.)

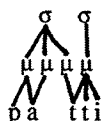
The only remaining difficulty lies in the fact that the overlong syllable, in the strong grade of all the words of this section, is more than three mora long. The derivation of the representation of 'boat (Ill. sg.)' would begin with the assignment of mora to all the segments:



The next step is syllabification which begins, as before, by scanning left to right. The initial mora would not be associated with the syllable because it already is associated with a consonant, would be deleted, and the initial /p/ re-associated with the new first mora. The process would continue to scan to the right and the syllable would keep associating mora until the limit of three is reached, and the structure would then look like this:



Since there are still vowel mora remaining in the word, the process would begin a new syllable. The second syllable would not associate with the two consonantal mora, but would associate with the mora containing the vowel. As before, the two consonantal mora would be deleted, which would make the consonant cluster a part of the onset of the second syllable and not part of the coda of the first syllable. This would make the structure look like this:



This would run counter to one of Harms' (1962:5) rules for determining phonemic syllable boundaries which states "[i]n a sequence of two stops...the syllable boundary falls between the two stops" [it would also disagree with the absurd statement in the dictionary (Saagpak, 1982:xliv) that says "a syllable does not begin with more than one consonant"]. This data seem to imply that there is a need for a syllable-final extrasyllabicity in Estonian as well as at the end of words. This extrasyllabic mora may be morphological (or lexical) only, but it is present. The derivation of 'boat (Ill. sg.)' would then proceed in the same fashion as above, except that the mora limit on the syllable is now four with the extrasyllabic mora. At that point it would look like this:



The second syllable would then syllabify as before, leaving the final form as:



Without the extrasyllabic mora the representation of all the examples in this section would be difficult at best. Fortunately there is some basis for such an analysis. Lehiste (in Bell and Hooper [eds.] 1978:81) states that "syllables constitute structural units in Estonian." Also Raun and Saareste (1965:21) say that "the syllable in Estonian is the basic operational unit". If these authors are correct (and there is no reason to believe otherwise) then the extrasyllabic mora is at the same kind of boundary as a morpheme (or word) boundary, where it has already been established that extrasyllabic mora can occur. The data (and the intuition of native speakers) argue strongly for this position.

Conclusion

The notion of extrasyllabic mora in phonological representations could be considered a diacritic. In Estonian, at least, there seems to be a strong motivation for it, not only at the ends of words, but at the end of overlong syllables. The other alternative would be to have syllables that are four (or more) mora long. Such a solution would, in this author's opinion, undermine the elegance of the representations of moraic theory.

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IV

MORPHOLOGY

'CONVERSION' WITHOUT PROCESS

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0. *Introduction.* A number of recent works on morphology treat certain matters in terms of a phenomenon they call 'conversion'. Since this phenomenon is particularly prominent in English, the discussion here uses English data. One definition (Bauer 1988: 241) characterizes it as 'the change in the part of speech of a form without any overt affix marking the change'. A set of examples of some uses of English *up* said to be related by 'conversion' is given in Table I. In Bauer's text, this treatment is embedded in an approach which takes the notion of process to be fundamental in morphology (and apparently in phonology also). This paper exemplifies various treatments of these phenomena by Twentieth Century linguists, with particular attention to how they can be treated in the relational model of language usually known as stratificational, as originated by Sydney M. Lamb in the 1960s and elaborated by Lamb himself and various others, including the present writer, since that time.

Table I. SOME USES OF ENGLISH *up* SAID TO BE RELATED BY 'CONVERSION' (Bauer 1988:241).

Robin climbed up the hill.
We'll have to up the prices again.
Lee caught the up train at 2:30.
Things are on the up and up.
We all have our ups and downs.
I've only just got up.

Though many linguistic textbooks do not mention 'conversion' as such at all, the term can be traced back as far as Kruisinga 1915. It is also used in Curme 1935 and mentioned, though rejected, in Jespersen 1942. In addition to the Bauer work mentioned above, more contemporary works which use it include Adams 1973, Bauer 1983, Quirk, Greenbaum, Leech, and Svartvik 1985, Jensen 1990, and Spencer 1991. The latter two are part of the recent generative literature on morphology.

1. *Historical Alternatives.* One earlier linguist who approached the phenomena of 'conversion' in a much different way was Leonard Bloomfield. He treated such matters with a concept he called CLASS-CLEAVAGE (1933:204), essentially an overlap in the membership of different grammatical classes. His initial example of the phenomenon involved the use of *one* as a pronoun in *if one only knew* versus as a noun in *a big one* (1933:204). Although the pro-

cessual nature of conversion seems to show much more in common with the views of Edward Sapir than with those of Bloomfield, it is not listed among the 'grammatical processes' discussed in Chapter 4 of Sapir 1921. More thorough research into Sapir's total opus will be required to determine whether he ever discussed this term or concept.

One of Bloomfield's more prominent followers, Charles Hockett, discussed the general phenomenon using an obvious version of class-cleavage. Hockett 1958 included a discussion of the English parts of speech which recognized, in place of the conventional NOUN, VERB, and ADJECTIVE, a total of seven classes, as shown in Table II.

Table II. HOCKETT'S SEVEN 'BASIC PARTS OF SPEECH' FOR ENGLISH. (1958:225-27).

<u>N</u>	<u>A</u>	<u>V</u>	<u>NA</u>
<i>strength</i>	<i>long</i>	<i>describe</i>	<i>American</i>
<i>food</i>	<i>false</i>	<i>admit</i>	<i>sweet</i>
<i>action</i>	<i>likely</i>	<i>punish</i>	<i>savage</i>
<i>day</i>	<i>certain</i>	<i>bury</i>	<i>private</i>
<i>friend</i>	<i>icy</i>	<i>strengthen</i>	<i>human</i>
<i>art</i>	<i>sleepy</i>	<i>falsify</i>	<i>male</i>
<i>danger</i>	<i>short</i>	<i>penetrate</i>	<i>white</i>
<i>music</i>	<i>soft</i>	<i>collaborate</i>	<i>red</i>
<i>boy</i>			<i>innocent</i>
<i>elephant</i>			
<u>NV</u>	<u>AV</u>	<u>NAV</u>	
<i>walk</i>	<i>clean</i>	<i>fancy</i>	
<i>love</i>	<i>dry</i>	<i>faint</i>	
<i>cure</i>	<i>thin</i>	<i>black</i>	
<i>change</i>	<i>slow</i>	<i>yellow</i>	
<i>air</i>	<i>clear</i>	<i>blue</i>	
<i>eye</i>	<i>busy</i>	<i>brown</i>	
<i>nose</i>	<i>idle</i>	<i>gray</i>	
<i>beard</i>	<i>true</i>	<i>damp</i>	

A contrasting approach was adopted by another noted Neo-Bloomfieldian, Hockett's longtime colleague at Cornell, Robert A. Hall, Jr., who in his 1964 textbook criticized Hockett's approach as 'rigid, clumsy, and wasteful'¹. As an alternative, he suggested the use of zero-suffixes to, for example, derive the verb *table* from the noun *table* or the noun *run* from the verb *run* (1964:134-35). This approach, suggested earlier by Jespersen (1942:85) amounts to a translation of conversion into morphemic terms: rather than positing a conversion process, Hall assigns the difference to a morpheme without an overt shape.

2. *Comparison of Approaches.* At this point it seems useful to pause to weigh the relative advantages and disadvantages of the approaches considered so far. The biggest advantage of the class-

cleavage approach over the others seems to be its complete objectivity and ease of application. One does not have to decide which of two or more usages is 'basic'. One just observes the existence of the different usages and sets up the description to reflect this observation in its classifications. This is doubtless the reason that such scholars as Bloomfield and Hockett preferred it.

The advantage of either the conversion or the zero-affixation approach, on the other hand, is that either one provides a way to deal with certain intuitions regarding the 'basic' versus 'secondary' nature of some usages. It makes a good deal of sense, for instance, to divide Hockett's NV class into two groups, as shown in Table III. Here the first class is basically nominal and only secondarily verbal, while the second is basically verbal and only secondarily nominal. The purely processual conversion approach would say here that the items in the first list are nouns which can undergo conversion to verbs, while the others are verbs which can be converted to nouns. The zero-affixation approach would rather treat the material as shown in Table IV, where each pair of braces is used to enclose a separate morpheme.

Table III. A SUBDIVISION OF
HOCKETT'S NV CLASS.

Basically Nominal	Basically Verbal
<i>air</i>	<i>walk</i>
<i>eye</i>	<i>love</i>
<i>nose</i>	<i>cure</i>
<i>beard</i>	<i>change</i>

Table IV. THE ZERO-AFFIXATION APPROACH

Verbs	Nouns
{walk}	{air}
{love}	{eye}
{cure}	{nose}
{change}	{beard}
{air} {Vn}	{walk} {Nv}
{eye} {Vn}	{love} {Nv}
{nose} {Vn}	{cure} {Nv}
{beard} {Vn}	{change} {Nv}

When it comes to comparing conversion and zero-affixation, we see that each requires more difficult analytic steps than the class-cleavage approach. At the same time, they share the advantage of allowing the distinctions made in Table III to be treated. They are also alike in that each raises a metatheoretical problem, though they differ as to what the specific problem is. In the view of the present writer and various others, the problem with conversion is the whole baggage of synchronic process which it requires. It does not really seem desirable to view linguistic structure as containing processes. While there are unquestionably real processes involved in the learning, use, and change of language, these real processes, as Lamb has pointed out (1975) can be better understood if we do not confuse the matter by positing pseudo-processes as part of the actual structure of language. This perceived weakness is probably why some like Hall (and maybe Jespersen) preferred the zero-affixation approach. The latter is roughly equivalent to conversion in its effects, but is part of a system of morphemes with patterns of arrangement and realization rather than part of a system of unreal processes.

Unfortunately, zero-affixation raises a different, but still

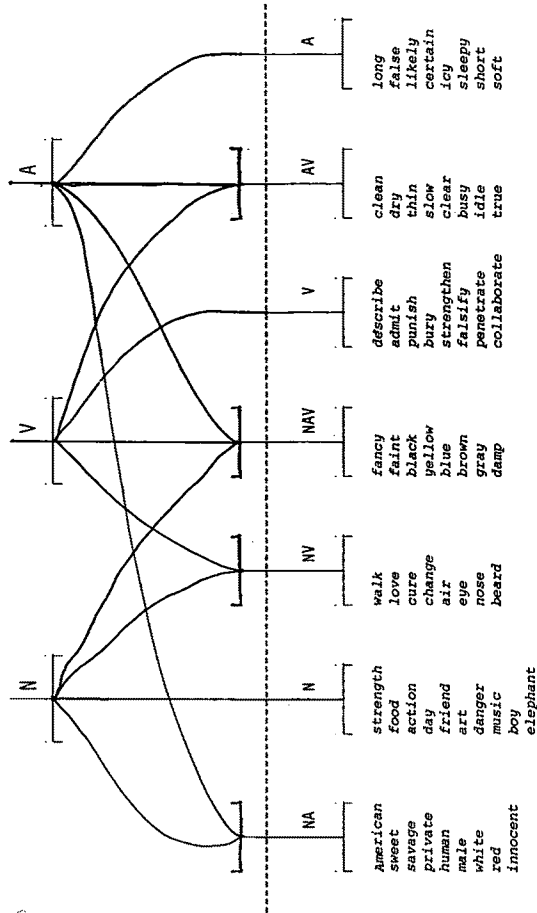
troubling set of problems. The idea of zero elements in language has been traced to the ancient Sanskrit grammarians, and it has been recognized in at least some form by most linguists in the present century. At the same time, there has been fairly strong agreement only for the use of zero as an allomorph in alternation with one or more overt shapes, as in the plural of *sheep*, or the past of *cut*². The idea of a totally zero morpheme has been either completely rejected or highly restricted³. In the present case, several of the questionable totally zero affixes would apparently be needed for English.

So, in summary, pure conversion runs up against a legitimate objection to processes in linguistic structure. The class-cleavage approach, on the other hand, can be accused of neglecting facts concerning the relative markedness of alternative functions. And finally, the attempt to use zero-affixation as a way of translating conversion into non-processual terms seems to posit multiple zero affixes, contrary to what many have seen as a highly reasonable restriction on the use of zero elements in models of linguistic structure.

3. *Conversion in a Stratificational Model.* In the remainder of this paper, the problem of conversion is approached using the stratificational theory of language, a model which has shown an ability to synthesize difficult alternatives in the past⁴. Various solutions to problems worked out in other frameworks are commonly translatable into the terms of a stratificational relational network, though truly processual or mutational formalisms can be directly translated only as a series of changing networks of a sort which is actually appropriate only for ontogenetic change, phylogenetic change, and some aspects of language use. Of the approaches discussed above, class-cleavage is obviously one which is readily interpretable as a network. The classes recognized by Hockett, shown in Table II, can be formalized as in Figure 1. The part most directly related to the table is below the dashed line. There each class is represented as a DOWNWARD UNORDERED OR relation, with one of Hockett's class labels given above each one. Besides these classes, Hockett also recognized the traditional categories NOUN, VERB, and ADJECTIVE as functions which the various members of the basic classes can fulfill. In his discussion, he compares these functions to skills required on an athletic team, and the members of the classes to individual players, coached for one or more skills as the case may be. The upper part of the diagram, above the dashed line, shows explicitly the connections between the classes and their major functions, as implied by Hockett's labels and discussion (1958:225-27).

However class-cleavage is presented, it still has the weakness mentioned above, since it fails to capture the distinctions shown in Table III. It must now be asked, then, whether the network in Figure 1 can be refined to capture these additional distinctions. The answer will be affirmative, but the revision required uses a relatively neglected kind of connection, the UPWARD ORDERED OR. A bit more about the history and function of this connection is

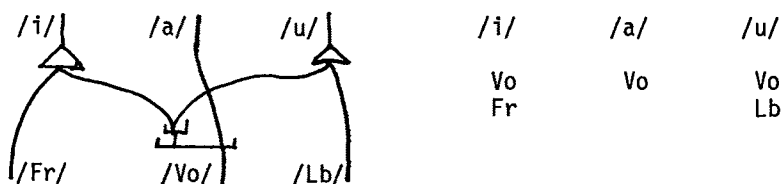
Figure 1. CLASS-CLEAVAGE IN A RELATIONAL NETWORK,
BASED ON HOCKETT 1958:225-27.



therefore in order.

Though the presentation of the notation in Lamb 1966 provided for the UPWARD ORDERED OR as a logical extension of the distinctions found in its overall system, no actual use was proposed for it there. One use was proposed in Reich 1969, but it was quite specific to Reich's own model for treating central embedding and related issues. Later, Herrick 1977 proposed a more straightforward use for this node, which is shown for some phonological data in Figure 2, a formalization of the information displayed in Table V. The data involved here is a typical three-vowel system, such as would be found in various kinds of Arabic, many Australian languages, and in the eastern (Inuit) varieties of Eskimo. The figure and table are alternative ways of displaying the relation between the three vowels of such a system and the simultaneous components (or PHONONS) which make them up. All the vowels contain /Vo/ (vocalic) and /a/, treated as the unmarked vowel, has this as its only component. The two other vowels each have an additional

Figure 2. RELATIONAL NETWORK FOR A TYPICAL THREE-VOWEL SYSTEM. Table V. PHONONIC ANALYSIS OF A TYPICAL THREE-VOWEL SYSTEM.



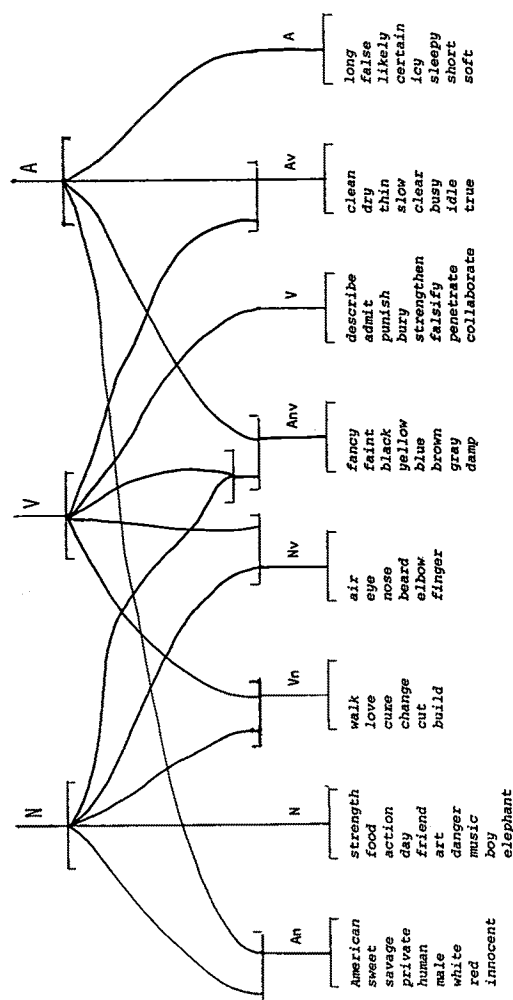
component to distinguish them from each other as well as from /a/. If we are thinking of using this information only from top to bottom, in an encoding direction, we could simply use a single UPWARD UNORDERED OR above /Vo/, indicating that a given occurrence of /Vo/ is either all of /a/ or part of /i/ or /u/. But Herrick introduced this seemingly more complex configuration because he did not want to neglect decoding, using the diagram from bottom to top. He reasoned that in decoding an occurrence of /Vo/ one should take /a/ only if neither of the other alternatives succeeds. So this kind of network gives precedence to the treatment of /Vo/ as a part of /i/ or /u/, but if these both fail, due to the unavailability of a simultaneous occurrence of either /Fr/ (frontal) or /Lb/ (labial), then one will choose the default decoding /a/.

Returning to Hockett's data, the same notion can be applied to this material to distinguish the two varieties of noun/verb cleavage given in Table III. This is presented in Figure 3, which refines Figure 1 by recognizing two types of NV cleavage, one with a default connection to NOUN and the other to VERB. The remaining connections to multiple functions are made according to the intuition of the present writer, as An (primarily ADJECTIVE, secondarily NOUN), Av (primarily ADJECTIVE, secondarily VERB), and Anv (primarily ADJECTIVE, secondarily either NOUN or VERB, with no precedence between the two secondary functions).

This is, then, a way for a relational network to capture the notion of 'basicness' involved in traditional 'conversion' without using either the concept of derivation by morphological processes or the questionable zero morphemes. There are, however, a couple of further things that need to be said about this approach. One problem concerns the lack of structural support for the intuition-based distinctions. Intuitions should not properly be treated as linguistic data, but only as useful hints on where to look for structurally-valid distinctions⁵. Since some of the basis for Figure 3 has, for the time being, been intuitive, it is to be hoped that further consideration will eventually turn up structurally valid facts to support such judgements.

A second question is whether zero-affixation might in the end be useful for some of the data, even if not for all of it. While a morpheme with zero as its only manifestation should not be posited, there is no valid objection to a zero allomorph in alternation with one or more overt shapes. Based on this view, putative zero affixes, as suggested in the tradition of Jespersen and Hall, should be carefully examined to see if they can be considered variants of

Figure 3. REVISION OF FIGURE 1 USING THE UPWARD ORDERED OR.



overtly realized affixes. Ultimately a large-scale examination of the relevant English data would be appropriate. In the absence of this, the present remarks are confined to general approaches and possibilities. To date, a limited consideration has revealed one possible case of complementation which does not hold up, and two others which may in the end be viable.

For the first illustration, consider the deadjectival verbalizing suffix *-en*, a few examples of which are presented in Table VI. Here the hypothesis that may be entertained is that this suffix is complementary with the verbalization evident in the Av class in Figure 3. Although there is no potential contrast with the given

Table VI. ADJECTIVE/VERB PAIRS RELATED BY THE DEADJECTIVAL VERBALIZING SUFFIX *-en*.

<i>black/blacken</i>	<i>hard/harden</i>	<i>sad/sadden</i>
<i>damp/dampen</i>	<i>light/lighten</i>	<i>short/shorten</i>
<i>dark/darken</i>	<i>quick/quicken</i>	<i>soft/soften</i>
<i>deaf/deafen</i>	<i>red/redden</i>	<i>weak/weaken</i>
<i>deep/deepen</i>	<i>ripe/ripen</i>	<i>wide/widen</i>

members of that list, the Anv list must also be considered, and it reveals *black* and *damp* as verbs in contrast to *blacken* and *dampen*. A neat example of this contrast in a sentence context involves *to short TO GIVE LESS THAN ONE IS ENTITLED TO* vs. *to shorten TO MAKE SHORTER*: in *She shorted me, the witch!* one is complaining about being left with fewer newspapers, less change, or some such and using *witch* as an epithet for an evil person; in *She shortened me, the witch!*, one is presumably in a supernatural context, where someone with the magic powers traditionally imputed to witches has made one shorter than before.

Some more successful examples involve overt differences which do not involve traditional prefixes or suffixes, but which still should be accorded morphemic status. First, the three parts of Table VII show that the verbalizing function applied to nouns can result in either (a) a voicing of a final voiceless fricative, (b) a difference of syllable nuclei, or (c) both of the above. If these examples are compared with those on the Nv list in Figure 3, no examples of contrast are found. In fact, the list contains no items with final voiceless fricatives which could be subject to voicing. So unless further data does reveal such a contrast, the hypothesis that denominal verbalizations with these overt differences and those with no difference are complementary, and likely coallomorphs, is valid.

Table VII. EXAMPLES OF THE OVERT MARKING OF DENOMINAL VERBS (Quirk et al. 1985:1566).

a. With final voiced fricative:

<i>house</i>	<i>grieve</i>	<i>mouth</i>
<i>advise</i>	<i>shelve</i>	<i>sheathe</i>
<i>use</i>		<i>wreathe</i>
<i>abuse</i>		

b. With distinct syllable nucleus:

<i>bleed</i>	<i>feed</i>
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c. With final voiced fricative and distinct nucleus:

<i>breathe</i>	<i>bathe</i>
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Finally, the examples in Table VIII show the well-known accent distinction between corresponding nouns and verbs, normally accompanied by differences in syllable nuclei as well, and involving mostly disyllabic words. Again, these examples appear to be in complementation with the Vn type of Figure 3. Being all monosyllables, they are not even candidates for differences of

Table VIII. DEVERBAL NOUNS WITH THE ACCENT PATTERN /' ~/
(Quirk et al. 1958:1566-67)

<i>abstract</i>	<i>consort</i>	<i>discount</i>	<i>increase</i>	<i>protest</i>	<i>survey</i>
<i>accent</i>	<i>construt</i>	<i>discourse</i>	<i>insult</i>	<i>rebel†</i>	<i>suspect</i>
<i>combine</i>	<i>contest</i>	<i>escort</i>	<i>misprint</i>	<i>record†</i>	<i>torment</i>
<i>compound</i>	<i>contrast</i>	<i>envelope</i>	<i>overflow</i>	<i>refill</i>	<i>transfer</i>
<i>compress</i>	<i>convert</i>	<i>export</i>	<i>perfume</i>	<i>refit</i>	<i>transform</i>
<i>concert</i>	<i>convict</i>	<i>extract</i>	<i>permit</i>	<i>regrès</i>	<i>transplant</i>
<i>conduct</i>	<i>decrease</i>	<i>ferment</i>	<i>pervert</i>	<i>reject</i>	<i>transport</i>
<i>confines</i>	<i>(dictate)</i>	<i>import</i>	<i>present†</i>	<i>resist</i>	<i>upsit</i>
<i>conflict</i>	<i>digest</i>	<i>impress</i>	<i>produce</i>	<i>(retail)</i>	
<i>conscript</i>	<i>discard</i>	<i>incline</i>	<i>progress</i>	<i>segment†</i>	

(Parenthesized examples generally lack the contrast in American English; examples marked with a dagger lack the usual subordinate accent on the final syllable.)

accent⁶.

4. *Conclusion.* The following general principles appear to be applicable to the treatment of 'conversion' in a relational network model: (1) a zero-affix approach is acceptable when the zero difference can be shown to be in non-contrastive distribution with an overt difference having morphemic status, such as those shown in Tables VII and VIII; (2) where no such interpretation is justified, the use of the UPWARD ORDERED OR relation can still allow a basic versus secondary function to be captured without the use of process in the structural model. Research should ultimately aim, however, to find structural facts to back up distinctions rather than relying on pure intuition.

NOTES

¹There is no explicit mention of Hockett as a practitioner of the approach criticized, though Hockett's chapter is listed in the general notes relevant to Hall's chapter (1964:137).

²The most severe restriction on the use of zeros is proposed by Haas, who would not treat the zeros in these examples as zero elements but as something different which he terms 'class-index zero' (1957:49-53).

³Eugene Nida would allow a totally zero morpheme only when 'the general structure suggests a zero element', as in a paradigm with an overt affix for all but one category (1949:46).

⁴Compare, for instance, V. Makkai 1969 and Lockwood 1973.

⁵This principle was taught to the present writer in the 1960s by Sydney M. Lamb, who reacted against the Chomskyan reliance on speakers' intuition as part of primary data.

⁶In American English, at least, the existence of items like *retail* and *dictate* as verbs as well as nouns shows that the classes conditioning the alternation between accent-pattern and zero cannot be based purely on the number of syllables in the word.

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CYCLICAL GRAMMATICALIZATION: PRONOUN & COPULA

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I. Introduction

Grammaticalization is often conceived of as a process whereby a lexical item becomes part of a grammatical paradigm, losing both its morphological independence and its concrete meaning, becoming reduced and bleached, and, eventually, if the process continues, vanishing into nothingness. We are led to believe that grammaticalization is unidirectional, always proceeding from the concrete to the abstract, from the independent word to the affix, from the optional to the obligatory, from the stressed variant to the reduced form. While changes in typology throughout the history of individual languages have been documented, the transformation from an agglutinative language to a synthetic, from an inflectional language to an isolating typology is seldom considered in terms of grammaticalization and the sorts of changes that it fosters.

This paper presents an example of circular grammaticalization, beginning with a lexical item, a stative verb, and evolving into another lexical item, a third person pronoun, and then returning once more to the function of the copula. Examples will be drawn from Turkish, Finnish and Hungarian and further from Biblical and Modern Hebrew. It will be seen that the Turkish third person singular pronoun *o(n)* evolved from the earlier verb *olmak*, that a common root for this pronominal form exists in both Hungarian and Finnish, and that an earlier Finnish pronoun *on* (currently *han*), derived from the *ol* root, was later reinterpreted as the third person singular conjugation of the verb 'to be'. Hence we have a sequence of verb, pronoun, verb, with no apparent reduction. Re-categorialization has long been recognized as a feature of grammaticalization. But it is seldom acknowledged that the result of the process might be a return to a state existing in a previous stage of the language.

The Hebrew example poses a further dilemma in terms of traditional interpretations of directionality. We see what amounts to a copula (though originally a deictic expression) transformed into a first person singular pronoun and then once more being reinterpreted as a copula. But the Hebrew example flies in the face of expectations where pronominal marking on the verb is concerned. When pronouns resemble personal endings on verbs, the most frequent explanation offered is that previously independent full forms were grammaticalized, reduced and affixed to the verb. This paper offers an example of the opposite: personal endings, together with parts of the lexical material in the verb, are reinterpreted as independent pronouns.

While the data challenge accepted notions of directionality, this body of evidence may help to uncover new patterns of grammaticalization previously unexplored. Perhaps directionality of grammaticalization of individual morphemes is closely related to the present state of a language and its currently active tendencies toward change.

II. Absent copulas and Reinterpretation

Hebrew does not require a present tense copula. Equative sentences fit the following pattern: NOUN NOUN or NOUN ADJECTIVE. See (1) and (2) below. For purposes of notation the first line of Hebrew glosses will be given in Aramaic characters, the second in phonetic transcription, the third as a morphological mapping and the fourth will be an English gloss.

- (1) יורם ילד גדול.
 yoram yeled gadol.
 [Yoram child(masc) big(masc)]
 'Yoram is a big boy.'
- (2) הוא גדול.
 hu gadol
 [he big(masc)]
 'He is big.'

However, for purposes of intensification, it has been permissible -- since as early as Biblical times -- to insert an echoing pronoun between the two parts of the equation, as in (3) below. In modern Hebrew this use of the pronoun is well on its way to being reinterpreted as a copula.

- (3) יורם הוא ילד גדול.
 yoram hu yeled gadol.
 [Yoram he child(masc) big(masc)]
 'Yoram is a big boy.'

A number of languages, Russian among them, do not require the verb 'to be' in the present tense in order to construct equative sentences. However, over time there seems to be a non-language-specific tendency to reanalyze other elements as the missing copula. In modern Hebrew the pronoun is often used to denote the absent verb. The sentence יורם הוא ילד גדול is literally *Yoram he big boy*. Inclusion of the pronoun is not required, nor is it the preferred style, but it is accepted in formal discourse. Colloquial usage has almost rendered the equative pronoun obligatory. In Russian, *Marina krasivaya* means *Marina is beautiful* (4). But a large number of uneducated Russians tend to say *Marina ona krasivaya* -- *Marina she beautiful* (5). The grammars tell us *ona* is a pronoun, but to many speakers it is taking on the function of a verb.

- (4) Marina krasivaya.
 [Marina beautiful(fem)]
 'Marina is beautiful.'
- (5) Marina ona krasivaya.
 [Marina she beautiful(fem)]
 'Marina is beautiful.'

Likewise in (6) and (7) below the masculine singular pronoun *on* is on its way to being reinterpreted as a verb. The reader would do well to keep the pronoun *on* in mind as we move into another language family: Finno-Ugric and its possible relation Turkish.

- (6) Ivan bolen.
 [Ivan sick(masc)]
 'Ivan is sick.'

- (7) Ivan on bolen.
 [Ivan he sick(masc)]
 'Ivan is sick.'

Examples (8) and (10) below show us the parallel forms in Turkish and Hungarian for the sentence *The sky is blue*. Note that neither has recourse to an overt copula.

- 8)
 Turkish: Gök mavi.
 Interlineal: [sky blue]
 English: 'The sky is blue.'
 (Erguvanli 1984:9)

Example (9) demonstrates how the statement *the sky is blue* differs from the phrase *the blue sky* in Turkish.

- (9)
 Turkish: mavi gök...
 Interlineal: [blue sky]
 English: 'the blue sky...'
 (Erguvanli Ibid)

- (10)
 Hungarian: Az ég kék.
 Interlineal: [the sky blue]
 English: 'The sky is blue.'
 (Benko 1972:91)

III. THE USES OF *ON*

So far, our examples have been unsurprising in their similarity. But now we turn to Finnish in sentence (11).

- (11)
 Finnish: Taivas on sininen.
 Interlineal: [sky is blue]
 English: 'The sky is blue.'
 (Lehtinen 1963:610)

What is that strange word *on* that we find intervening between *sky* and *blue*? Our previous discussion may well have prepared us to deduce that *on* is the third person singular pronoun. But it is **not**: at least not in Modern Finnish. It is, in fact, the third person singular conjugation of the verb *to be*. The stem of the Finnish verb *to be* is *ole-*.

- (12)(a) The Finnish verb 'ole-' in the present tense
 (with corresponding pronouns)

	Singular	Plural
1st person (mina)	ole-n (me)	ole-mme
2nd person (sina)	ole-t (te)	ole-tte
3rd person hän, se	on	he, ne o-vat

The Finnish third person singular of 'to be' is a glaring anomaly. One may be tempted to attribute it to a borrowing of the third person Russian pronoun. But see (12) (b) and (c).

(12) (b) The Turkish third person pronouns:

	Singular	Plural
abs.	<i>o</i>	<i>onlar</i>
acc.	<i>onu</i>	<i>onlari</i>
gen.	<i>onun</i>	<i>onlarin</i>
dat.	<i>ona</i>	<i>onlara</i>
loc.	<i>onda</i>	<i>onlarda</i>
abl.	<i>ondan</i>	<i>onlardan</i>

(Lewis 1967:67)

While the absolutive form of the singular pronoun is *o*, a cursory examination of the paradigm will reveal that the underlying form is *on* and that the missing *n* appears everywhere except in the absolutive singular.

We now turn to the pronouns in nineteenth century Hungarian.

(12) (c) The Hungarian nominative pronouns:

	Singular	Plural
1st	<i>en</i>	<i>mi</i>
2nd familiar	<i>te</i>	<i>ti</i>
2nd formal	<i>on</i>	<i>onok</i>
3rd	<i>o</i>	<i>ok</i>

(Remele 1843:79)

In this case, the singular third person form is *o* and the addition of the plural ending *k* does not reveal an underlying *n*. But, when we turn to the formal second person pronouns, we find that the *n* has been preserved. The explanation for this is fairly simple: the formal address was developed from the third person pronouns. Since this is a later development, the *n* was retained in the formal address, long after it was dropped in the original usage of the root for third person pronouns.

Thus we see that both Turkish and Hungarian had at one time a third person singular pronoun *on*. While the genetic connection between Turkish and Finnish has not been definitively established, the relationship between Hungarian and Finnish is well established. So that when we turn to the curious paradigm of the verb *to be* in Finnish, we would be well advised to consider the possibility that the third person conjugation was formerly the third person pronoun.

The course of this development may be plotted in tandem with typological changes to be found among the three languages. Turkish is by far the most conservative, possessing a flexible SOV order and very rarely requiring the usage of pronouns or copula. Finnish is on the other end of the spectrum. Finnish word order is inflexibly SVO. Use of third person pronouns is mandatory. The copula is indispensable. Hungarian seems to find itself in the middle of the progression, meeting neither extreme. The Hungarian word order is so flexible that some have termed it "free word order." Without getting into the question of whether there is such a thing as free word order, it is sufficient to say that any number of surface orders can be found in

Hungarian sentences. In Hungarian the present tense copula is required in all persons except third. Likewise, pronouns are mandatory, everywhere but in third person.

Examples (13) through (18) show different instances of word order and the use or omission of pronouns in Finnish, Hungarian and Turkish. Sentence (13) demonstrates SVO word order in (a) and the obligatory use of a copula (b) in Finnish.

- (13)
 (a) Finnish: Han nieli sen.
 Interlineal: [s/he swallow(past) it(accusative)]
 Finnish: 'She swallowed it.'
 (b) Finnish: Se on kynä.
 Interlineal: [this is(3rd, present) pencil]
 English: 'It's a pencil.'

Example (14) shows the OV(S) word order in Turkish and the fact that no pronominal subject is required. Person marking is on the verb.

- (14)
 Turkish: Çok bazirgan gyurdum.
 Interlineal: [many merchants saw (1st person past)]
 English: 'I saw many merchants.'
 (Vaughan 1709:63)

Sentence (15) displays omission of the subject and an (S)VO ordering in Hungarian.

- (15)
 Hungarian: Ebedel.
 Interlineal: [eat(3rd person sg. present) the dinner]
 English: 'He eats dinner (dines).'

In (16) We see an example of the incredibly flexible word ordering in Hungarian.

- (16)
 Hungarian: Janos az asztalra tette a könyvet.
 Interlineal: [Janos the table-on put the book-acc]
 (b)
 Hungarian: *Janos a könyvet az asztalra tette* '.
 Interlineal: [Janos the book-acc the table-on put]
 (c)
 Hungarian: A könyvet az asztalra tette Janos.
 Interlineal: [the book-acc the table-on put Janos]

English (for a, b, c): 'Janos put the book on the table.'
 (Kiss 1986:19)

Equally acceptable are each of the word orders in (a) (b) and (c) of (16) above. Thus we can have SVO, SOV or OSV. In equative sentences, the verb *to be* is required in Hungarian in all persons but the third. Third person singular and plural do not require an explicit copula. See (17) for examples.

(17)(a)

Hungarian: Gazdag vagyok.
 Interlineal: [rich(sg.) be(1st sg.)]
 English: 'I am rich.'

(b)

Hungarian: Gazdag vagy
 Interlineal: [rich(sg.) be(2nd sg.)]
 English: 'You are rich.'

(c)

Hungarian: Gazdag. (or empathic: O gazdag.)
 Interlineal: [rich(sg.)] [s/he rich(sg)]
 English: 'He is rich.'

In example (18) we see a full sentence in Turkish with no nouns or pronouns. Note that while the second and third persons display personal marking, the third person singular form is unmarked for person.

(18)

(a)

Turkish: geldim
 Interlineal: [come-past-1st sg.] English: 'I came.'

(b)

Turkish: geldisin
 Interlineal: [come- past-2nd sg.] English: 'You came.'

(c)

Turkish: geldi
 Interlineal: [come-past-3rd sg.] English: 'He came.'

We might envision the progression in typology of equative sentences in the three languages as set forth in Figure 1 below.

TURKISH	HUNGARIAN	FINNISH
NOUN NOUN = (SOV)	NOUN NOUN = (SOV)	
	NOUN PRONOUN NOUN (Indetr.)	NOUN PRONOUN NOUN
		NOUN VERB NOUN (SVO)

Figure 1.
 Progression of Word Orders

Reanalysis of the former pronoun *on* in Finnish probably went through the stages set down in (19). (Unattested forms will henceforth be marked with a %.)

(19)

(a) STAGE ONE

Finnish: % Taivas sininen.
 Interlineal: [sky blue]
 English: 'The sky is blue.'

Finnish: % On sininen.
 Interlineal: [s/he blue]
 English: 'It's blue.'

(b) STAGE TWO

Finnish: % Taivas (on) sininen.
 Interlineal: [sky (s/he) blue]
 English: 'The sky is blue.'

At this stage, the pronoun was optional and used for emphasis.

(c) STAGE THREE

Finnish: Taivas on sininen.
 Interlineal: [sky is blue]
 English: 'The sky is blue.'

(Lehtinen 1963:610)

This represents the current state. On is now a verb and its use is obligatory.

The above in itself would serve as a satisfying explanation for the third person conjugation of the verb *to be* in Finnish and its connection to general typological developments in that language. But this opens up whole new vistas for exploration. We now know that *on* was a pronoun before it came to be a verb in Finnish. We may well ask: what was *on* before it became a pronoun? For the answer to this question, we turn once more to Turkish.

IV. THE ORIGIN OF *ON* IN TURKISH

Turkish, as an agglutinative language, has very little real need for either pronouns or the verb *to be*. The explanation for this is the idea of zero morphology or the default form. Absence can be as linguistically significant as presence, since failure to morphologically mark a grammatical category will trigger the default category. In Turkish, the default person is third. The default number is singular. And the default verbal root is the verb *to be*. Lewis (1967:136) contains the entire paradigm for verbal marking in Turkish. For purposes of this examination, however, it is sufficient to take note of the personal endings as set forth in (20) and the tense markers outlined in (21).

(20) The Turkish personal endings:

SINGULAR

	Type 1	Type 2	Type 3
1st	-im	-m	-eyim
2nd	-sin	-n	-esin
3rd	(-dir)		-e
PLURAL			
1st	-iz	-k	-elim
2nd	-siniz	-niz	-esiniz
3rd	(-dir)ler	-ler	-eler

(Lewis 1967:136)

In a sentence that contains no nominal subjects, pronominal subjects are expressed by affixing the pronominal endings to the verb or adjective in question, as in (22) below.

(21) The Turkish tense markers:

PRESENT	FUTURE	AORIST	MIS-PAST	NEC.	DI-PAST	COND.	SUBJ.
-iyor	-ecek	-ir	-mis	-meli	-di	-se	-e

(Lewis 1967:136)

The tense markers are affixed to the verbal root before any person markers. When tense marker appears without a verbal root, the default verb *to be* comes into play.

(22) Present tense statements about being Turkish.

SINGULAR

1st	Turkum	'I am Turkish'
2nd	Turksun	'You are Turkish'
3rd	Turk	'He is Turkish'

PLURAL

1st	Turkuz	'We are Turkish'
2nd	Turksunuz	'You are Turkish'
3rd	Turkler	'They are Turkish'

In order to form the past tense of the verb *to be*, the past marker is affixed, as in (23) and (24).

(23)

Turkish: Turktu

Interlineal: [Turkish + di-past]

English gloss: 'He/she was Turkish.'

(24)

Turkish: Sorumluydunuz

Interlineal: [responsible + di-past+ 2nd. pl. affix]

English gloss: 'You were responsible.'

Given that pronouns are not necessary in Turkish, we can easily envision a time in the history of the language when independent pronouns did not exist. However, with a zero morpheme for the verb *to be* and another zero

morpheme for the third person singular, we are presented with the following dilemma: The Turkish for 'He is' would be null. And it is from this idiosyncrasy that the present third person singular pronoun in Turkish arose.

While Turkish does not use a copula for equative sentences, it nevertheless does have a verb *to be* which can be fully conjugated. That verb is *olmak*. Its root is *ol*. It means roughly *to be, to become, to happen, to mature*. Examples (25) and (26) illustrate the distinction between the use of the tense and person markings alone and the use of the root verb *ol*.

(Lewis 1967:141-142)

(25)

Turkish: Bir zelzeleyidi.

Interlineal: [one earthquake + di-past]

English gloss: 'It was an earthquake.'

(26)

Turkish: Bir zelzele oldu.

Interlineal: [one earthquake *ol*+ di-past]

English gloss: 'An earthquake occurred.'

From this we can see that the *ol* version of *to be* is more lexical than the zero morpheme. It carries more semantic significance than mere equativeness. And yet *ol* is the only variant available for exhortation and general discussions of "being", such as in (27).

(27)

(a) Turkish: Olunuz!

Interlineal: [*ol*+ 2nd pl.]

English gloss: 'Be!'

(b)

Turkish: Olasi.

Interlineal: [*ol*+ cond.]

English gloss: 'May he/she be.'

(c)

Turkish: Olamam.

Interlineal: [*ol*+neg+ 1st person sg.]

English gloss: 'I cannot be.'

With the verbal root *ol* in mind, we turn once more to the question of the earlier situation in Turkish, when there were no pronouns. How would one say *He is*? The possibility that comes readily to mind would be *ol*, consisting of the verbal root together with the null third person singular ending. Lewis (1967:67) confirms this when he notes that "in pre-nineteenth century texts" the usual form of the third person singular absolutive was *ol*.

The development of the verbal root into an independent pronoun in Turkish must have followed the pattern indicated in (28) below.

(28) Answers in response to the question "Who is Turkish?"

(a)

Turkish: Ol.

NATIVE SPEAKER'S ANALYSIS: [*ol*+ null 3rd sg. marker.]

English gloss: 'He is.'

(b) Turkish: *Ol.*
 NATIVE SPEAKER'S ANALYSIS: [3rd sg. pronoun + null verb *to be*]
 English gloss: 'He is.'

The reanalysis described above is something that must have taken place very early in the history of the Turkish language, long before it could properly be termed Turkish. The reason for the later nasalization of the alveolar consonant may have been as a result of dissimilation in the environment of the plural marker. Thus *ol + lar* may have been confusing when it resulted in *ollar* and the first *l* may have been nasalized to compensate. Later the nasalization may have spread throughout the paradigm. The plural form in pre-nineteenth century Turkish is already nasalized, confirming this theory.

Whatever the reason for the transformation from *ol* to *on* in Turkish, the same process seems to have occurred at an even faster rate in Hungarian and Finnish. While Hungarian shows no reflexes of the original *ol*, Finnish retains the *ol* root in its *to be* verb. Yet the other persons seem to have been created by a normal process of conjugation, while the third person singular shows traces of the pronoun.

Another indication that *on* in Finnish is not merely a nasalized version of the third person conjugation of *ole* is the fact that the third person singular ending in Finnish for monosyllabic roots is *pi* or *vi*. Roots with several syllables end with a lengthened vowel. (Lehtinen 1963:67) *On* follows neither of these patterns.

Thus we see that the root *ol* underwent the following changes from the protolanguage to Finnish: VERB --> PRONOUN --> VERB.

The fact that an old lexical item has been recycled is perhaps surprising in view of the linear, unidirectional expectations in the field of grammaticalization. Likewise, the form is independent and stressed. On the other hand, it does seem that in the process of re-categorialization *on* has been somewhat bleached. The new verb *to be* that it represents is purely one of equation. Some of the other attributes of *ol*, such as *to happen*, *to become*, *to mature* have been discarded. All that remains is the pure copula. In that sense, the abstraction that we come to expect as a product of grammaticalization has been effected.

V. THE CYCLE OF PRONOUNS IN HEBREW

Biblical Hebrew possesses a complete system of personal marking on the verb for both subject and object. Older texts are very sparing in the use of pronouns. The more modern the discourse, the more pronouns it deploys. This would lead one to speculate that in the far past, Hebrew, or its ancestor, did not possess pronouns at all. This section will explore the possible origins of the independent Hebrew pronouns.

This paper will limit itself, for purposes of demonstration, to the first person singular marking, although similar phenomena can be detected elsewhere. An unmistakeable mark of the first person singular in Hebrew, taken overall and applied to nouns and verbs alike, is the ending ' (i). If the word ילד (*yeled*) means 'boy', then ילדי (*yaldi*) means 'my boy', if הנה (*hiney*) means 'here is' then (הינ-ני) (*hin-ni*) means 'here am I', if את (*et*) is the direct object marker, then אתי (*oti*) signifies 'me' as direct object, if הלך (*halax*) means 'he went' then הלכתי (*halaxti*) means 'I went'. If הכה (*hika*) means 'he struck then

הכני (*hikani*) means 'he struck me', while הכתי (*hiketi*) means 'I struck'. The common element to indicate first person singular is the 'י' (*i*). Traditional theories of grammaticalization would postulate an earlier free form that was reduced and then adhered, and this paper does not seek to dispel this notion. The ני (*ni*) in הנני (*hin-ni*) and in הכני (*hikani*) is clearly a reduced form of the first person independent pronoun אני (*ani*.) Likewise it may be that the more general marker (*i*) comes from an earlier independent form. However, it seems that between the period of the independent 'י' (*i*) and of the independent אני (*ani*) there may have been a time where Hebrew functioned entirely without independent pronouns, marking first person by means of the 'י' (*i*) ending affixed to both verbs and nouns. Example (29) explores such a projected progression.

(29) Answers in response to the question "(Where) are you?"

(a) STAGE ONE

Hebrew: הני % [hini]

NATIVE SPEAKER'S ANALYSIS: [here + *i* (1st sg. marker.)]

English gloss: 'Here I am.'

(b) STAGE TWO

Hebrew: אני [ani]

NATIVE SPEAKER'S ANALYSIS: [1st sg. pronoun + null verb *to be*]

English gloss: 'I am.'

Note: The 'h' has been lost and the root has been bleached of its deictic meaning. All that remains is first person singular and a sense of existence.

(c) STAGE THREE

Hebrew: הנה אני [hiney ani]

NATIVE SPEAKER'S ANALYSIS: [here + 1st sg. pronoun]

English gloss: 'Here I am.'

Note: This is a valid sentence in modern Hebrew, although it's too analytic for Biblical Hebrew.

(d) STAGE FOUR

Hebrew: הנני [hineyni/hin-ni]

NATIVE SPEAKER'S ANALYSIS: [here + 1st sg. marker]

English gloss: '(Here) I am/I am.'

Note: Here אני (*ani*) has been reduced and affixed to the deictic element as if it were a verbal marker *ni*, and as if the doubled *n* were a complete coincidence. The fact that vowel alone defines first person singular has been forgotten.

The case of the plural first person marking is analogous. The main difference is that the vowel in question is *u*, not *i*. The evidence that first person verbal marking provides is particularly interesting since it demonstrates that separate pronouns, at this point at least, were an innovation in the language. They derived from lexical material that was reanalyzed as pronominal. After a separate pronoun was thus created, it later affixed itself to verbal morphology, despite the obvious redundancy. At this point in the cycle, pronouns are created from person marking, not the other way around. The person marking on both nouns and verbs preceded the present set of pronouns. Later synthesis of those same pronouns into verbal markings added little in the way of abstraction. It merely confused the paradigms. If anything was accomplished by this innovation, it was the differentiation of verbs from nouns in certain conjugations, a difference that

is not always that obvious in Hebrew.

A similar transformation seems to have occurred with the third person singular masculine and feminine pronouns הוא and היא which derive from the root הוה/היה 'to be'. So that if we turn to (3), above, 'יורם הוא ילד גדול', we may find that the modern speaker of Hebrew has come full circle in his analysis of the pronoun as copula.

VI. CONCLUSION

We have seen that cyclical transformations from equative verb to pronoun to equative verb once more are evident in two very different language families. While this is undoubtedly a case of grammaticalization at work, it does not meet some of the current expectations for the process: namely, the segments are not reduced, they are not lost, they are merely re-categorized and restored once more to their former function.

Should we always have the same expectations for the results of grammaticalization? This question is obliquely addressed in the following quote (Bybee 1991:42): "Typology may contribute to the correlations. Thus, for example, a particular language may not only have more fused grams, but also may tend to have older grams ...it would mean that morphological typology is not only a matter of form, but also of semantic content. That is, we might conclude that grams in isolating language are *less* grammaticized -- in both meaning and form -- than grams in agglutinative languages, which are in turn less grammaticized than grams in fusional or inflectional languages."

Are grams in isolating languages less grammaticized? In the case of the creation of separate pronouns out of verbal morphology, especially when the use of these pronouns becomes obligatory, as in Finnish, it would seem that the direction is from an agglutinative language to an isolating, or at the very least, an inflectional language. While it would be difficult to claim that Finnish is currently isolating, given its impressive catalog of declensions, in comparison to its previous forms, one might say that it is moving in the direction of isolation. It may never arrive there, but while it is tending that way, we find that its separate forms, such as the pronoun, are recent innovations, whereas its bound morphemes, like the root *ol* are older. But the older form is not more grammaticized, it is less so, for it has undergone fewer cycles of change.

In the long run, it would be difficult to determine the grammatical age of any given linguistic form except in relation to the overall direction of change in that language. That is, we would have to take a measure of the use of the particular form at two, if not more, distinct points in time. An entirely synchronic examination would not yield conclusive evidence of degree of grammaticalization. This is especially true since lexical material is often recycled over and over again.

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USING PROTOTYPE THEORY TO UNDERSTAND THE CONCEPT OF BOUND MORPHEMES IN CHINESE *

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Introduction

Students of Chinese as a second language spend huge amounts of time trying to remember and figure out how to use their new vocabulary. They commonly spend countless hours with flashcards, a technique, by the way, which is an indication of non-Chinese learning the language one morpheme at a time. The students' palms sweat during in-class substitution drills which require them to find appropriate ways to fit new vocabulary into given sentence patterns. They stretch their imaginations during fluency exercises in which they are asked to experiment with the language. In order to develop their skills with the language, they need reliable information about how much freedom they have in using their new vocabulary. The distinction between bound and free morphemes would seem to be of some help: if a morpheme is bound, it can never be used independently. Unfortunately, generally agreed upon information about which morphemes are bound and which are free is rather hard to come by. Further complicating the matter, however, is that the distinction between bound and free is not as sharp as it at first appears.

The traditional distinction

Tāng Tíngchí (1988:9) states that morphemes which can appear independently are called free. Morphemes which must be attached to other morphemes are called bound. Norman (1988:154), who is in agreement on that differentiation, illustrates free morphemes with gōu 狗 'dog', which can be uttered independently but which is bound in some compounds, such as mǔgōu 'female dog'. Norman's illustration of a bound morpheme is hóu 猴 'monkey', which he says always occurs in conjunction with another morpheme, as in, for example, hóuzi 'monkey'. The traditional view thus seems to be that, when the terms bound and free are used to refer to the general classification of a particular morpheme (rather than to how a morpheme is used in a specific context), membership in the categories of bound morphemes and free morphemes is an either/or situation. As Chao Yuén Rèn (1968:144) explains, a morpheme is classified as free if it is sometimes free; it is classified as bound if it is always bound.

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Disagreement about specific instances

Despite the apparent theoretical simplicity of distinguishing bound from free morphemes, in actual practice, there is common disagreement about how to use those labels concerning specific morphemes. For example, Chao and Yang (1947) say that qè 各 'each, every, various' is bound. Zhāng Sōnglín (1990:18), however, judges that it is free. Tāng Tíngchí (1988:187) maintains that hùn 混 'to confuse' is a bound morpheme. Chao and Yang (1947), on the other hand, label it as free. Zhāng Sōnglín (1990:17) classifies gòng 共 'altogether' as a free morpheme. Chao and Yang (1947) in contrast say that it is bound.

Not only is there disagreement about distinguishing bound morphemes from free morphemes, but also there seems to be fuzziness between bound morphemes and constituent elements of polysyllabic morphemes. Tāng Tíngchí (1988:9), for instance, lists làngmàn 'romantic, rakish, sluttish' as a disyllabic morpheme. Chéng and Tian's (1989:215) position that làngmàn is a product of both transliteration and translation, however, suggests that the two component elements are meaningful units themselves. Interestingly, Chao and Yang (1947) classify làng 'dissipated, extravagant' as a bound morpheme. Another example is jùlèbù 'club'. Tāng Tíngchí (1988:11) considers this word to be a single polysyllabic morpheme. Nevertheless, in the opinion of Yip Poching (1992:65), jùlèbù is an example of a transliteration 'with a hint of semantic motivation'. Indeed, it does seem, since Chéng and Tian (1989:215) also regard jùlèbù as a product of both transliteration and translation, that the component elements of this word can be seen as separate meaningful units: jù 'all', lè 'happy' and bù 'unit'. Again, it is interesting to note that Chao and Yang (1947) classify bù as a bound morpheme. Getting reliable and consistent information about whether something which appears to be a bound morpheme really is or is not a bound morpheme can sometimes be a difficult job.

Prototype theory

Such scholarly disagreement leads one to ask whether membership in the category bound morpheme is actually an either/or matter. Prototype theory, as an alternative to traditional views of categorization, can perhaps provide a more satisfactory view of bound morphemes in Chinese. Prototype theory is commonly contrasted with the classical view on the question of whether categories are defined by necessary and sufficient conditions (Geeraerts 1989:588). There apparently are some concepts which are defined by necessary and sufficient conditions. Even number is an example (Smith 1989:502-3). Membership in this

category seems to be a yes-or-no matter, and the boundaries of the category seem to be clear-cut. However, as Coleman and Kay (1981) and others have demonstrated, many concepts are not defined in this way. These studies have found that the basis of categorization often is not a set of necessary and sufficient conditions but rather is similarity to a prototype. They have also found that categories often have fuzzy rather than clear-cut boundaries and that members of a category often exhibit degrees of representativity (that is, instead of all members having equal status, some instances are seen to be better examples than others) (Geeraerts 1988:285, 1989:592-3).

Prototype theory has been used, for example, to explain linguistic categories such as word and affix. Although there are clear examples of what a word is, it is nevertheless well known that word is extremely difficult to define. Also, there are several kinds of marginal members of this category, such as hyphenations and contractions. Furthermore, the categories word and affix seem to have fuzzy boundaries which overlap. (Taylor 1989:174-90). Thus it seems more accurate to view a category such as word as one which has prototypical members rather than a definition made up of necessary and sufficient conditions, some members being judged to be better than others rather than all members being of equal status, and fuzzy rather than clear-cut boundaries.

Problems with defining bound morpheme

How can prototype theory be used to improve understanding of bound morphemes in Chinese? We have already seen that, according to the traditional view, membership in the category bound morpheme is a yes-or-no matter. If a morpheme is ever used independently, it is considered to be free; if it is never used independently, it is bound (Norman 1988:154). Nevertheless, there is some disagreement about this definition. The term bound morpheme is sometimes understood to refer to morphemes which never occur unattached to another morpheme (Tuggy 1992:238); that is, it is often seen to refer to a morpheme being inseparable from another morpheme (Huang 1984:63). An example is yǐ # 'chair', which must be used with another morpheme, as in yǐzi 'chair' (Tang 1988:93). However, the term bound morpheme is sometimes understood to refer to morphemes which must be in a near context with the morpheme to which it is bound. In other words, a bound morpheme is not necessarily inseparable from the morpheme to which it is bound. For example, fà # 'hair' is considered to be a bound morpheme. Nevertheless, one can say lǐ wánle yí cì fà 'has finished having one haircut', in which lǐfà 'have a haircut' is separated by several syllables (Chào and

Yáng 1947, Cháo 1968:159-60). Inseparability thus does not seem to be a necessary condition in a definition of the category bound morpheme.

Moreover, there is another interpretation about what sort of dependence is necessary for a morpheme to be classified as bound. Consider, for example, that Cháo Yuén Rèn (1968:143,155) defines free morpheme as one that can be uttered alone and bound morpheme as one that cannot occur as an utterance (such as an answer to a question). For instance, that bǐ 比 'pen' can answer the question zhè shì shénme? 'What's this?' is proof that bǐ can be said independently (Lǚ 1962:2). Clearly, this sense of dependence and independence is different from the sense which is based on the question of inseparability. Furthermore, both of those senses are different from the sense of dependence which requires a bound morpheme only to be in the near context of the morpheme to which it is bound.

Another point of contention in defining bound morphemes involves the commonness of the contexts which are examined. Lǚ Shūxiāng (1962:1,4) argues that a judgment about whether a morpheme is bound or free should be made by referring to how it is used in ordinary circumstances rather than special examples. The traditional view that a morpheme is free if it is ever free and bound if it is always bound obviously involved consideration of any possible usage. However, if one accepts Lǚ Shūxiāng's standard of judgment that only ordinary circumstances should be considered, a new problem emerges: how should ordinary circumstances be distinguished from circumstances which are not ordinary? For example, bí 鼻 'nose' is generally considered bound (Cháo and Yáng 1947). However, in medical literature, bí can be used alone (Lǚ 1962:3). Should such usage be considered ordinary or special? There are thus different standards for deciding what is or is not a bound morpheme. It does not seem possible to give a precise definition made up of necessary and sufficient conditions.

Degrees of typicality and fuzziness

Prototypical categories generally not only lack a definition made up of necessary and sufficient conditions, but also have members which exhibit degrees of typicality (Geeraerts 1989:600). There are some morphemes about which there seems to be no argument concerning their classification as bound. Huī 輝 'brightness, splendor', for example, is said definitely to be a bound morpheme (Lǚ 1962:4). It is perhaps a prototypical bound morpheme. On the other hand, we have already seen in this paper several examples of morphemes which seem less representative of the category and are perhaps only marginal members.

The degree of representativity can diminish to such an extent that it can become difficult to say

whether something is member of a category or not. Such a situation would be an instance of another common characteristic of a prototypical category: fuzzy rather than clear-cut boundaries (Geeraerts 1989:593,595-6). Consider, for example, that some morphemes which generally cannot be used alone appear to be used alone in idioms. A specific illustration is zhī 知 'to know', which appears to be used freely in bù zhī bù jué 'unconsciously, without being aware of it' (Lǚ 1962:3). Huáng Shuānfàn (1976:128) says that zhī should be considered a word, which would make it appear free. Chāo and Yáng (1947), on the other hand, say that it is bound.

Conclusion

The category bound morpheme thus has characteristics considered to be typical of a prototypical category. It seems impossible to arrive at an acceptable list of necessary and sufficient conditions which might make up a precise definition of this term. Membership in the category instead seems based on similarity to a prototype. Membership in the category also indicates degrees of representativity and fuzzy boundaries. That bound morpheme lacks distinct boundaries is not a new discovery (see Lǚ 1962:4, for example); nevertheless, we have already seen that scholars have been reluctant to stop viewing the category as one for which membership is a yes-or-no matter. Perhaps this analysis based on prototype theory can help correct that situation.

There are reasons which can help explain the disagreement we have seen about whether specific instances are bound morphemes. Historical increases in the number of bound morphemes, a speaker's familiarity with the classical language, and his or her facility with the modern spoken language can help explain such divergence of opinion (Hoosain 1991:19-20). Though understandable, the disagreement exists nonetheless and might even suggest that the term bound morpheme is not useful for learners of Chinese as a second language. However, the term can serve a function if it is used carefully to apply to typical members of the category and if it is made clear that the term is often used to refer to instances which are perhaps at best only marginal members. Otherwise, use of the term bound morpheme could easily give students false impressions.

Prototype theory has proven to be useful in a number of areas in linguistics (see the sources cited in Geeraerts 1989:591). Future work might involve applying prototype theory to other linguistic categories and incorporating the prototypical concept of boundedness with other features of monosyllabic morphemes to develop a new, integrated method of classification.

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CHINESE: A NOT-SO-ANALYTIC LANGUAGE

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1. Introduction

Chinese is generally regarded as a typical analytic language because it has neither inflectional morphology such as that of Latin, nor the kind of affixation found in agglutinative languages such as Japanese or Korean. However, this kind of classification does not characterize the modern Chinese language adequately.¹ Historically the language, as in the archaic or classical period, could be appropriately termed analytic, where a word typically consists of one morpheme in one syllable. In the course of history the emergence and development of an aspectual system, causative patterning, the resultative verb construction, deictive verbal expression, verbal complementation, passives, the disposal construction, etc. have led the once isolating language away from its relatively pure analytic state to one in which structural networkings are more transparent. This is largely achieved by means of verbal adposition as a grammatical coding device.

Structurally most of these developments have resulted in an array of forms ranging from V-V to V-Particle in modern Chinese, in which the relationship between the two V's is so tight that they behave practically like a word syntactically. The nature of these adpositions is such that it makes 'word boundary' a perennial issue in synchronic Chinese linguistics (see e.g. Lu 1984, Wang 1985), for in very many cases there simply is no clear word boundary. Instead there is a gradation of word-hood. The problem stems from the fact that the status of these adpositions (historically independent words) as words ranges from a full-fledged verbality (i.e. independent lexicality) to mere affix status (i.e. a structural boundness) depending on what other verbs they cooccur with to express certain meanings. Perhaps the notion of *formatives* (Anderson 1985:161) can be applied to the individual subparts of the V-V, and *conformatives* to the entire construction. The significance of their roles as conformatives far outweighs the problem of whether they are words or not. It is the extreme productivity of these conformatives and the boundness between them, similar to that between a stem and its suffix, that render modern Chinese not so analytic. It is these productive verbal affixes that are the main concerns of this paper.

In what follows we will first demonstrate the structural relationship between the core morpheme and its adposition to show that they work together like a stem and affix. Next we will discuss the semantic aspect of adpositions to show that often the adpositions have reduced or lost their lexical content and gained in grammatical functions. Lastly we will show that they are productive and widespread in the language.

¹See also Anderson (1985).

2. Structural relationship between a verb and its adposition

An adposition occurs immediately before or after the core verb, as shown in (1a) and (1b), suffixing (i.e. (1a)) being the predominant pattern.

- | | | | | | | |
|-----|--|-------------------|---|-------------------|---|----------------------|
| (1) | | verb ₁ | + | verb ₂ | + | (verb ₃) |
| | | | | | | |
| a. | | core/stem | | postpositive | | (postpositive) |
| b. | | prepositive | | core/stem | | (postpositive) |

Examples are seen in (2a) and (2b) respectively. (Stem/core verbs are underlined; Prog-ASP: progressive aspect; St-ASP: stative aspect)

- | | | | | |
|-----|------|--------------------------|---------------------------|--|
| (2) | a.i | <u>xie</u> qi lai | write rise come | 'upon writing; begin to write' |
| | a.ii | <u>xie</u> wan | write finish | 'finish writing' |
| | b.i | zheng zai <u>xie</u> zhe | EMP Prog-ASP write St-ASP | 'to be right in the middle of writing' |
| | b.ii | bai <u>xie</u> | white write | 'to write in vain' |

The adpositions may be stem verbs in a different context (e.g. in *Ta qi lai le* he rise come 'He got up' *qi* is the stem verb and *lai* is an adposition/suffix) but in (2) they are affixes. They tend to lose stress and become neutral toned. Their position relative to the verb is fixed; they cannot be separated from the stem. If topicalized, the adposition must appear with the stem, as in (3). It cannot undergo conjunction reduction, (4); cannot be left out (e.g. in yes/no echo answers), as shown in (5). A parenthetical statement, a pause, or an object may not intervene between the stem and the affix, (6). If for some involuntary reason (e.g. a cough) the speaker stops at the stem (or adposition), repair or resumption must be made with the entire stem+adposition form. In other words, syntactically the stem and the adposition together behave like a word.

- (3) a. Chi-guang, wo ke bu gan, wo zhi chi le yi kou.
eat-empty, 1sg EMPH not dare, 1sg only eat PERF one mouth
'As for eating up, I wouldn't dare, I only had one bite.'
b. *Chi wo ke bu gan guang, wo zhi chi le yi kou.
eat, 1sg EMPH not dare empty, 1sg only eat PERF one mouth
- (4) a. Ta ba yu xi-hao ye qie-hao
3sg BA_{Obj} fish wash-good also cut-good
'She finished cleaning the fish and also finished cutting it. (She cleaned and cut the fish.)'
b. *Ta ba yu xi ye qie-hao.
- (5) a. Q: Ta ba fan chi-guang le ma?
3g BA_{Obj} rice eat-empty PERF Q
'Did he ate up all the rice?'
b. Ans: Chi-guang le.
'Yes, [he] did.'
c. Ans: *Chi le.
d. Ans: *Guang le.
- (6) *Ta xi yu hao.
3sg wash fish good
'She finished cleaning the fish.'

Given the evidence so far, one might consider these as mere polysyllabic words. Our contention is that their linguistic significance goes beyond 'word', in the sense that there is productive patterning in them. If these were considered merely as polysyllabic words, the dictionary would have to enter all of them. The

fact that dictionaries list extremely few of them indicates that the native speakers treat them as structural patterning (see Section 4 below). Indeed, the verbal adposition phenomenon is a good example of what can happen between the lexicon and grammar. The modern Chinese language particularly thrives on this. Perhaps one can characterize this kind of grammatical coding as the Chinese brand of 'morphology'. Given the typological characteristics of the language, this is as close to 'morphology' as it can be (cf. Traugott and Heine 1991:9).

3. Semantic/syntactic property of adpositions

Verbal adposition in modern Chinese is so widespread that, in the interest of space, we can only discuss some cases that are most productive. These are the adpositions whose functions are more grammatical than lexical. Thus adpositions (*po* 'broken') in a resultative verb construction (*da-po* hit broken 'to break') will not be discussed here, even though the adposition (*po*) is quite active, (e.g. *kan-po* see broken 'to see through a scheme', *gong-po* attack broken 'to take down a city; to disprove a hypothesis', *che-po* tear broken 'to expose a lie', *zhen-po* detect broken 'to break a case'). The function of adpositions like *po* is mainly semantic -- metaphorical. Admittedly, the distinction between metaphorical meaning and structural meaning can be blurry sometimes, for metaphorical extension can lead to 'bleaching' and eventually to grammaticalization, Chinese is full of examples like this (see Chen 1992). Adpositions like *po* affix only to a limited number of verbs; on the other hand, what we consider here are those that cooccur with a wide variety of verbs. For these morphemes the productivity is so great that they can be considered independently lexemes,² like productive affixes of other languages

In this section we will discuss (a) degree of grammaticalization and (b) types of adpositions. The latter can be roughly classified into two groups: (i) those expressing phases of action and (ii) those coding tone of voice/attitude of the speaker. There is a strong bias toward end state of action and negative attitude.

Productive adpositions often display different degrees of lexicalness and grammaticalness, and many of them can function as full-fledged verbs. As full-fledged verbs their lexical content is at its fullest. When appended to main verbs as adpositions they lose some of their lexical content but gain in grammatical function. Take the word *diao* 'to fall; to drop' for example. In (7), as the main verb, it means 'to fall'; whereas in (8), as a suffix, it has the grammatical meanings of 'completion of action' and 'the object has disappeared as a consequence of the action', (9).

- (7) Sanwenzhi *diao* zai di shang.
sandwich fall at ground on
'The sandwich fell on the floor.'
- (8) a. Sanwenzhi ta chi-*diao* le.
sandwich 3sg eat-fall/finish ASP
'He ate up the sandwich, [too bad].'
cf b. Sanwenzhi ta chi le.
sandwich 3sg eat ASP
'[Yes,] he ate the sandwich [already].'
- (9) Fangzi mai *diao* le.
house sell fall ASP

²For the term lexeme see Lamb (1966).

'The house was sold. [Implying: 'The house is no longer available.]'

Since the meaning of *diao* as an affix is 'the object is no longer there due to the action of the verb', it also has the grammatical meaning that the action is complete. In this regard it is similar to the perfective aspect marker *le*. However, because of this extra baggage of meaning (equivalent to 'too bad its gone'), it is not as purely a grammatical affix as the aspect marker *le*, and as a consequence it has less productivity than *le*. It must cooccur with verbs of action in which the entity that is impacted by the action disappears as a result of the action, as in *chi-diao* 'eat up', *diu-diao* 'throw away', *si-diao* 'died', *na-diao* 'take away', *dang-diao* 'pawn off', *qu-diao* 'get rid of', etc. It cannot be a suffix to verbs that do not involve the disappearance of an entity impacted. These verbs include *kan* 'to see', *xiang* 'to think', *sheng* 'to give birth', *chan* 'to produce', *zuo* 'to cook', etc., thus: **kan-diao*, **xiang-diao*, **sheng-diao*, **chan-diao*, **zuo-diao*. The status of the affix *diao* as halfway between grammatical and semantic (lexical) formatives is quite typical of most adpositions, and so are the accompanying syntactic consequences.

The categories that these adpositions encode are different from those commonly found in the Western languages, such as person, number, gender, or tense. Instead, some of them are for coding tone of voice, such as expressing (the speaker's) sense of futility, adversity, etc. For example the word *bai* 'white; to be white', when used as a prefix to a stem verb, it expresses the speaker's view of the action as being a futile one.

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|------|-----------------------|--------------------|--|
| (10) | <i>bai-zuo</i> | white do | 'to do in vain' |
| (11) | <i>bai-nian</i> | white read | 'It is a waste to read [it].' |
| (12) | <i>bai-teng ta le</i> | white love 3sg ASP | 'It's been a waste to lavish love on him.' |

The word *guang* 'empty; light; shine' is another example. When used as a prefix it encodes the speaker's attitude about the action as being 'not enough', as shown in (13); but when used as a suffix to the verb, it encodes the aspect of the action where the impacted multiple entities (or a large quantity) disappear one by one until none are left, (14).

- (13) *Ta guang-shuo bu zuo.*
 3sg empty-say not do
 'He only talks and does not act.'
- (14) *Sanwenzhi ta chi-guang le.*
 sandwich 3sg eat-empty ASP
 'He ate up all the sandwiches.'

In a way, the prefix *guang*, as illustrated in (13), grammatically encodes the speaker's disapproval. This sense is absent in the lexical meaning of the word *guang*; it exists (or is acquired) only when it functions as a prefix. On the other hand, as a suffix *guang* is a coding of disappearance and number/amount. Because of its presence the impacted entity is interpreted as plural, (15b), or in large quantity (at least from the speaker's current point of view), (16b).

- (15) a. *Ren zou le.*
 people go ASP
 'The guy/guys has/have left.'
- b. *Ren zou-guang le.*
 people go-empty ASP
 'They/the crowd dispersed.'

- (16) a. Ta he le nei bei cha.
3sg drink ASP DEM CL tea
'He drank the cup of tea.'
b. Ta he-guang le nei bei cha.
3sg drink-empty ASP DEM CL tea
'He drank up all the tea in the cup.'

Thus, compared with (15a), (15b) shows that the suffix *guang* is a grammatical coding of amount as plural. Similarly, in (16b) it is a grammatical coding of the speaker's attitude that the amount of the object is large. Notice that the lexical meaning of *guang* does not involve number or amount at all; such meaning is acquired because of its structural role as suffix.

From data shown in (13)-(14) we see that prefix *guang* is used for coding the speaker's attitude of disapproval concerning the action as not enough, and from examples shown in (15)-(16) we see that the suffix *guang* is used for coding plurality (or large quantity). Chinese tends to code the speaker's attitude structurally (by means of adposition, as we have seen in the above examples, and/or preposition, such as *bei-/jiao*-passives) even though lexical means are available.

Evidence of grammaticalization of attitude or tone of voice in this language is further provided by the following four types of *V+adposition* constructions: (a) *V+ge+V* (where *ge* is a particle) for coding the meaning of satisfaction/satiation on the part of the speaker, (17); (b) *V+ge+N+dou/jiu* for the negative attitude of complaint, (18); (c) *V+ge+shenme* 'what' for the negative attitude of snideness and sneering³, (19); and (d) *V+si+N+le* for exaggeration, (20)-(21).

- (17) a. shui-ge gou sleep-PART enough 'to sleep to one's heart's content'
b. ma-ge gou scold-PART enough 'to scold a person to one's heart's content'
c. chi-ge guoyin eat-PART satisfy 'to eat to satisfy one's craving'
- (18) a. Chi-ge fan dou mei shijian.
eat-PART meal even not-have time
'[I] don't even have the time to eat.'
b. Shang-ge cesuo dou bu xing.
go PART restroom even not okay
'[I] couldn't even go to the restroom.'
- (19) a. Ni dong-ge shenme.
2sg understand PART what
'What do you understand! [You don't know a thing!]'
b. Ta xie-ge shenme.
3sg write PART what
'What does he know about writing! [I wouldn't call that a writing!]'
- (20) Zuo-si wo le
do-die 1sg ASP
'[I] am absolutely exhausted from having worked at it.'
- (21) Le-si wo le.
happy-die 1sg ASP
'[I] was absolutely delirious [at the happy turn of events].'

The function of the particle *ge* in the constructions (17)-(19) does not correspond to its independent function as a classifier (as in *yi ge cesuo* one CL restroom 'a restroom'). It is there, along with the rest of the construction, to code/express the speaker's attitude. Without the adposition *ge* in (19), the structure *V+shenme*

³Cf. Zhang (1991)

can function as a genuine question or in several other pragmatic roles, depending on context or intonation, but with *ge*, the construction is exclusively an overt coding of a sneer. The adposition *si* in the construction as shown in (21)-(22), though retaining more lexical meaning ('to die'), has basically the function of grammaticizing the attitude of exaggeration, the grammatical structure being *V+si+N+le*. Structural *conformations* like these are common in Chinese, where the functional meaning of the construction as a whole is not the sum total of the meanings which the components have when occurring independently. As a piece of independent evidence, we may cite the reduplication construction observed by Chen Jianmin (1984), as in *Ni jì shenme jì*. you squeeze what squeeze '= Quit pushing me! [as uttered in a crowded bus]'. Moreover, this construction is yet another example of grammatical coding of negative attitude in the language.

Besides attitude, the language also seems to favor grammaticizing end state of action: adpositions are used to particularize and categorize different endings, (22)-(26).

(22) chi le	eat ASP	'[He] ate.'	perfective
(23) chi wan le	eat end ASP	'[He] has finished eating.'	action is done
(24) chi hao le	eat good	'[He] has finished eating.'	action is successfully done
(25) chi guang le	eat light ASP	'[He] ate.all of them.'	obj is gone one by one
(26) chi diao le	eat fall ASP	'[He] ate it.'	obj is gone, <u>too bad!</u>

To summarize, in terms of function there are two main types of adpositions: (a) aspectual and (b) attitudinal; in terms of semantic/syntactic property there are the types that are more grammatical and there are those more lexical.

(27) Adpositions according to function:

- (A) Aspectual
- (B) Attitudinal

(28) Aspectuals of event phases according to their grammaticality/delexicality:

----->		
(A) aspectual markers	(B) deictic aspectuals	(D) Resultative
	(C) aspectual verbs	

The aspect markers, as shown in (A) below, are the most productive; deictic aspectuals (i.e. adpositions that have their sources in deictic verbs) and aspectual verbs are next; and the resultative verbs are the least. Resultative verbs are not as important for our purpose, because they are comparatively most lexical and least grammatical. Needless to say this is a prototypicality classification, and the groups can overlap.

Examples of (27) and (28) are as follows.

(A) Aspect markers

a.	stative	-zhe ⁴		kan-zhe	'stay looking'
b.	progressive	zai-	(be at)	zai-kan	'is looking'
c.	perfective	-le ⁵		kan-le	'already looked'

⁴There is no meaning synchronically except the meaning as a stative/durative aspect marker.

⁵There is no meaning synchronically except the meaning as an aspect marker.

d.	experiential	-guo	(pass)	kan-guo	'have looked/seen before'
(B) Deictic aspectuals					
a.	inchoative	-qilai	(rise-come)	zuo-qilai	'upon doing it'
b.	emergence	-lai	(come)	xing-lai	'wake up'
c.	momentary	-yixia	(one-down)	xiang-yixia	'think for a moment'
d.	continuative	-xiaqu	(down-go)	zuo-xiaqu	'keep on doing'
e.	cumulative	-xialai	(down-come)	zuo-xialai	'keep on doing and in the end'
C) Aspectual verbs					
a.	end state	-wan	(finish; complete)		
b.		-hao	(finish successfully)		
c.		-guang	(finished and depleted)		
d.		-diao	(finished and got rid of)		
(D) Resultative					
a.	consequence		nong-ping	do straight	'to straighten'
(E) Attitudinal					
a.	adversative	-diao	(drop)	chi-diao	'ate up'
b.	intensity	-si	(die)	le-si wo le	'I'm extremely happy'
c.	futility	bai-	(white)	bai-zhu le	'cooked in vain'
d.	insufficient	guang-	(light)	guang-shuo	'merely talked'

4. The widespread phenomenon of adpositions

In this section it will be shown that (a) adpositions are very productive, and (b) the adposition phenomenon is widespread, in the sense that many grammatical structures require verbal adposition as part of their makeup.

As was said earlier productivity of an adposition correlates with its grammaticality and desemanticity. The aspect markers (*zhe*, *zai*, *le*, *guo* shown in section 3) are the most productive. Since they are well recognized and extensively discussed in the literature (see e.g. Li and Thompson 1981), they will not be repeated here. Instead, we will discuss cases whose grammatical functions are not generally recognized. We will use the examples of *bai* and *guang* that we have seen earlier for illustration.

The word *bai*- in the following examples has a lexical meaning of 'white; to be white' when functioning as stative verb (*Nei zhang zhi hen bai*, Dem CL very white 'That sheet of paper is very white.'), but as a prefix it encodes the meaning that the speaker views the action as 'in vain; without the expected result'.

(29) a. bai -shuo le	white speak ASP	'[I/you/he] have/has said in vain/to no avail.'
(30) a. bai-zuo le	white do ASP	'done " "
(31) a. bai-xie le	white write ASP	'written " "
(32) a. bai-nuli le	white work-hard ASP	'worked hard " "
(33) a. bai-zhu le	white cook ASP	'cooked " "
(34) a. bai-xiang le	white think ASP	'considered " "
(35) a. bai-jieshi le	white diet ASP	'toiled " "
(36) a. bai-xisheng le	white sacrifice ASP	'sacrificed " "
(37) a. bai-si le	white die ASP	'[He] died " "

Contrast the above with the following corresponding examples without the prefix *bai*. Without the prefix the speaker's view that the action is no longer there.

(29) b. shuo le	speak ASP	'[I/you/he have/has said.'
(30) b. zuo le	do ASP	'done.'
(31) b. xie le	write ASP	'written'

(32) b. nuli le	work-hard ASP	'	"	worked hard.'
(33) b. zhu le	cook ASP	'	"	cooked.
(34) b. xiang le	think ASP	'	"	considered.'
(35) b. jieshi le	diet ASP	'	"	dieted.
(36) b. xisheng le	sacrifice ASP	'	"	sacrificed.'
(37) b. si le	die ASP	[He]		died.'

To be sure, the language has alternative ways of expressing the speaker's attitude of futility. For example, in (29c) the attitude of the speaker is not coded grammatically but lexically by way of an independent word *meiyong* 'useless'.

- (29) c. shuo le ye *meiyong* speak ASP also useless [I/you/he] have/has said in vain/to no avail.'

The verbal prefix *guang-* provides another example. Lexically it means 'light; ray' (*aikesi guang* 'X-ray'), as a prefix it means 'merely; the action itself alone is not enough', (30a)-(38), and as a suffix it means 'empty; all gone', (30b)-(32b).

(30) a. Ta guang-shuo bu zuo. 3sg light speak not do	'He merely said it without doing anything.'		
(31) a. guang-zuo	light do	[It was not enough] just to do '	
(32) a. guang-chi	light eat	'	" just to eat.'
(33) guang-xie	light write	'	" just to write.'
(34) guan-nuli	light work hard	'	" just to work hard.'
(35) guang-zhu	light cook	'	" just to have cooked '
(36) guang-xiang	light think	'	" just to think.'
(37) guang-jieshi	light be on diet	'	" just to diet.'
(38) guang-zuo	light sit	'	" just to sit.'
(30) b. Hua bei ta shuo-guang le.	words by 3sg say light/empty ASP	'He exhausted all the words [that I intended to say].'	
(31) b. Shiqing bei ta zuo-guang le.	thing by 3sg do light/empty ASP	'He has done all of them. [I'm left without anything to do.]'	
(32) b. Tang ta chi-guang le.	candies 3sg eat light/empty	'He ate up all the candies.'	

So far in this section we have shown how productive an adposition can be; next we will show that verbal adposition is widespread, in that many grammatical constructions require verbal adposition. They include causatives, (33); *ba*-disposal, (34); passives, (35)-(36), verbal complementation, (37) etc. (*: indicates unacceptability for the intended meaning shown in the translation.)

(33) a. Ta nong-po hezi.	3sg do broken ASP box	'He broke the box.'
b. *Ta nong hezi.	3sg do ASP box	'He broke the box.'
c. *Ta po hezi.	3sg broken ASP box	'He broke the box.'
(34) a. Ta ba hezi mai-diao.	3sg BA box sell fall	'He sold the box.'
b. *Ta ba hezi mai.	3sg BA box sell	'He sold the box.'
c. *Ta ba hezi diao.	3sg BA box fall	'He sold the box.'
(35) a. Hezi bei mai-diao.	box BEI (=by) sell fall	'The box was sold. [Too bad, it's gone.]'
b. *Hezi bei mai.	box BEI (=by) sell fall	'The box was sold.'
(36) a. Hezi gei mai-diao.	box GEI (=by) sell fall	'The box was sold. [Too bad, it's gone.]'
b. *Hezi gei mai.	box GEI (=by) sell fall	'The box was sold.'
(37) a. Ta chi-de kuai.	3sg eat COMP fast	'He eats fast.'
b. *Ta chi kuai.	3sg eat fast	'He eats fast.'

5. Concluding remarks

The adpositions we have discussed have often been regarded as verbal compounds. However, the term compound tends to suggest compositional

meaning, which is not quite true of the meaning derived from such combination. We hope to have shown that the verb+adposition constructions are not mere verbal compounds or polysyllabic words, and that the affixes, from a very limited subset of verbs, retain little of the lexical meaning and function more like a grammatical encoder for verbal aspects and attitude. It is the high frequency of appearance of these syntactic-semantic structures, especially in the colloquial style, that renders the language not so analytic. What is even more significant is that this type of construction has increased greatly in modern Chinese (see Chen 1993) as compared with the Classical language, where this kind of construction is very rarely found.

The increase of these de-lexicalized, particle-like adpositions and their synchronic co-existence with the corresponding full-fledged lexical verbs in various degrees of grammaticalness in Modern Chinese magnifies problems for linguistic theories that assume both clear word boundaries and distinct grammatical categories, the latter being needed for rule applications. Another interesting thing that has come up from the discussion is that the notion of conformation, as found in verbal adposition and especially the codependent construction of attitudinal coding discussed in connection with examples (17)–(21), is more useful in the description of Chinese syntax than the notions of autonomous words and categories.

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PARAMETERS FOR LEXICAL SYLLABIFICATION

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0. **INTRODUCTION.** It is usually assumed in models of level-ordered morphology that the domain of lexical syllabification has to be stipulated. Thus for languages like French it would be identical to the word. For others, like English, German, or Dutch, it would be identical to the stem resulting from a particular level of word formation rules which has been morphologically and syntactically defined in English (e.g. Selkirk 1982, Mohanan 1986) and prosodically defined in Dutch (e.g. van der Hulst 1984, Kooij and van der Niet 1985).

A closer look reveals, however, that the proper distinction to make in the Germanic languages is one between following stems (as in prefixed and compound words) and following affixes (as in suffixed words); and with respect to the latter, between consonant- and vowel-initial suffixes. It is proposed that in these languages the domain of cyclic syllabification is the 'morpheme', which subsumes roots and affixes. In the course of the derivation syllable structure is adjusted in the postcyclic component before vowel-initial suffixes to provide them with onsets and therefore unmark them, but not before consonant-initial suffixes which are already of the unmarked CV type.

In other languages, like French, syllabification does not respect morphological structure. It is proposed that it is not arbitrary whether a language chooses the word or the morpheme as domain of lexical syllabification, but that it follows from the more general role played by morphological structure in the language.

1. **LEVEL-ORDERED MORPHOLOGY.** A number of linguists have elaborated on the SPE classification of English affixes into two types, those attaching to bound stems and words by the + boundary symbol (1a) and those attaching only to words by the # boundary symbol (1b).

- | | | |
|--------|-----------------|---------------------|
| (1) a. | [con+[tribute]] | b. [non#[specific]] |
| | [de+[tonate]] | [re#[assemble]] |
| | [[Japan]+ese] | [[village]#er] |
| | [[democrac]+y] | [[open]#ing] |

The difference in boundary types is claimed to be responsible for the differential behavior of stress rules and rules of segmental phonology with respect to these affixes. In particular, it is suggested that + boundary affixes, later known as Class I affixes, lie in the domain of stress assignment rules. They can either themselves receive primary stress (e.g. 'tribute vs. 'contribute,

Ja'pan vs. *Japan'ese*) or induce a rightward shift of the main stress in the words they attach to (e.g. '*democrat*, *de'mocracy*). On the other hand, # boundary affixes, later known as Class II affixes are said to be stress-neutral, that is, altogether ignored by stress rules (e.g. '*village* vs. '*villager*). Similarly, segmental rules like Trisyllabic Laxing (2a), Velar Softening (2b) and Coronal Assibilation (2c) are shown not to take Class II affixes into account. Other rules which are otherwise restricted to word-final environment, such as Sonorant Syllabification (2d), apply before class II, but not Class I, affixes.

- | | | | | | |
|-----|---------------------------|--------------------------------|-----|---------------------------------|------|
| (2) | | CLASS I | | CLASS II | |
| a. | <i>div<u>ine</u></i> [ai] | <i>div<u>in</u>ity</i> | [i] | <i>div<u>in</u>ely</i> | [ai] |
| b. | <i>med<u>i</u>c-</i> [k] | <i>med<u>i</u>cine</i> | [s] | | |
| c. | <i>per<u>mi</u>t</i> [t] | <i>per<u>mi</u>ssion</i> | [ʃ] | <i>per<u>mi</u>tt<u>ing</u></i> | [t] |
| d. | <i>h<u>in</u>der</i> [r] | <i>h<u>in</u>dr<u>ance</u></i> | [r] | <i>h<u>in</u>der<u>er</u></i> | [r] |

Later models of what ultimately became known as Lexical Phonology account for the different stress properties of the two classes of affixes by extrinsic ordering: stress assignment is said to take place after Class I and before Class II affixation, as illustrated in (3) following Kiparsky 1982 (e.g. Siegel 1974, Allen 1978, Pesetsky 1979, Kiparsky 1982, 1983, and Mohanan 1986). See also Selkirk 1982 and Sproat 1985 for a syntactic account of the different types of affixes.

- | | | |
|-----|------------------------|-------------------|
| (3) | MORPHOLOGY | PHONOLOGY |
| | 1. Class I Affixation | |
| | Irregular Inflection | |
| | ----- | Stress Assignment |
| | 2. Class II Affixation | |
| | ----- | |
| | Compounding | Compound Stress |
| | 3. Regular Inflection | |

Besides accounting for the behavior of affixes with respect to stress, this proposal is also meant to account for the order in which affixes stack up in words. In particular, Class II affixes appear outside Class I affixes, but not the reverse, as shown in (4), where morphological brackets replace SPE-type boundaries.

- | | | |
|-----|--|--|
| (4) | *[<i>in</i> -[[<i>mis</i> -[<i>edu</i> - <i>cate</i>]]- <i>ed</i>]] | *[[[<i>thank</i> - <i>less</i>]- <i>ness</i>]- <i>ion</i>] |
| | I II I II | II II I |

The differences in levels of affixation are also said to be reflected in other phonological properties, including the ones relating to syllabification. Thus, for Selkirk 1982, English syllabification rules are said to have the first level as their domain and therefore fail to incorporate later affixes into canonical syllable structure patterns. Thus, 'the fact that *m* of

rhythm is syllabic before the neutral *-y* (*rhythmy*) but not before the nonneutral *-ic* (*rhythmic*) is to be attributed to the fact that the *m* "syllabifies with" *-ic*, but not with *-y*' (Selkirk 1982:130, note 3).

For Mohanan 1986, on the other hand, syllabification rules reapply after Level II-Class II affixation. Supporting evidence is the fact that, following stems ending in syllabic consonants (e.g. *hinder*, *simple*), Class I and II vowel-initial suffixes are preceded by non-syllabic consonants and are thus syllabified with the suffix. Hence, in (5a) where . represents a syllable boundary, the cluster /pl/ is syllabified with the suffix, as is the [bl] cluster in the noun *doubling* (5b). Later affixation, such as regular inflection, on the other hand, involves optional syllabification of the cluster with the suffix and compounding no such intermorphemic syllabification. Thus, for the verb *doubling* there is an alternative pronunciation with a syllabic liquid, and the compound has only the syllabic pronunciation.

- (5) a. *simple* [sɪmpl]
 simplify (class I) [sɪm.plɪfai]
 simply (class II) [sɪm.plɪ]
- b. *double* [dʌbl]
 doubling, N (class II) [dʌ.bliŋ]
 doubling, V (reg.infl) [dʌ.bliŋ], [dʌ.bɪ.iŋ]
 double edged (compound) ----- [dʌ.bɪ.ɛdʒd]

2. PHONOLOGICAL PROBLEMS. The distinction between different classes of affixes and level-ordering has been shown to cause difficulties for both morphological and phonological descriptions of English and other languages to which it has been applied (e.g. Strauss 1982, Booij and Rubach 1984, Kooij and van der Niet 1985, Hargus 1988, Inkelas 1989, Szpyra 1989, Bochner 1993). Only phonology-related difficulties, and specifically those relating to syllabification, will be addressed here.

The facts of English syllabification need to be reexamined. Just like inflections, a number of Class II vowel-initial suffixes trigger two pronunciations in stems ending in syllabic consonants. Thus, the forms in (6), where underlined segments represent ambisyllabic clusters, can be pronounced with syllabic stem-final, or with non-syllabic sonorants syllabified with the suffix.

- (6) *metrical* [metrɪkɪ] *metrically* [metrɪ.kɪ.i], [metrɪ.kɪi]
 feather [fɛðr̩] *feathery* [fɛðr̩.i], [fɛðrɪi]
 flatter [flæt̩r̩] *flatterer* [flæt̩r̩.r̩], [flæt̩r̩r̩]
 broker [brɒk̩r̩] *brokerage* [brɒ.k̩r̩.idʒ], [brɒ.krɪdʒ]
 vixen [vɪks̩n] *vixenish* [vɪk.sp̩.ɪʃ], -----

Similarly, words derived with a number of Class I vowel-initial suffixes have a syllabic and a non-syllabic pronunciation (7a).

Stress falling on the stem-final syllable (7b) constitutes an exception, as it triggers a vowel+consonant pronunciation, thus excluding syllabic sonorants. ('represents primary, ,secondary stress.)

(7) a.	<i>flatter</i>	[flætɹ]	<i>flattery</i>	[flætɹ.i],	[flætɹi]
	<i>cancel</i>	[kæns]	<i>cancellation</i>	[kæn.s].eiʃp],	[kæn.'sleiʃp]
	<i>fatal</i>	[feit]	<i>fatalistic</i>	[fei.t].istik]	-----
	<i>human</i>	[hjuɹp]	<i>humanize</i>	[hju.m].aiz],	[hjuɹð.,naiz]
	<i>symbol</i>	[simb]	<i>symbolism</i>	[sim.b].izɹ],	[simbð.,lizɹ]
b.	<i>total</i>	[tot]	<i>totality</i>		[to'tæliti]
	<i>vulgar</i>	[vʌlgɹ]	<i>vulgarity</i>		[vʌl'gæriti]
	<i>urban</i>	[ʌrb]	<i>urbanity</i>		[ʌr'bæniti]

It thus appears that the determining factor for a syllabic sonorant in a derived word is not the type of affix (compounds and level III affixes according to Mohanan, or Class II and above following Selkirk). Rather, it is the existence of a root or stem ending in a syllabic sonorant which, when unstressed, can be optionally preserved with many suffixes by analogy with the base word. Except for compounds, an alternate pronunciation exists with the consonant in question syllabified with the suffix, or following lax vowels, ambisyllabic between the stem and suffix.¹

Likewise, the facts about English stress assignment need to be reexamined, in particular, the contention that Class II affixes lie outside its domain. Class II prefixes have been shown to have their own stress patterns, and are therefore assumed to undergo stress assignment either in the lexicon, just like underived morphemes (Siegel 1974, Strauss 1982), or by cyclic assignment during the derivation. And, although Class II suffixes are said not to undergo the stress rules, some clearly carry secondary stress (e.g., *-ful*, *-hood*, *-less*, *-ship*, *-some*, *-ize*, *-ism*) and must therefore also undergo a stress cycle followed by a stress subordination rule.

Similar phonology-related problems have been noted in Dutch. Thus Kooij and van der Niet 1985 note that Class II suffixes constitute a very heterogeneous class. They contain a number of suffixes which behave as elements of compounds: they receive secondary stress, can undergo gapping and do not syllabify with the stem. Their examples are given in (8a). Similar examples from German are given in (8b) (see Giegerich 1985 for lists of German Class I and II suffixes).

¹It is not clear at this point why analogy operates with some suffixes, but not with others (compare Class I *simplicity* [l] with *fatalistic* [l], and Class II *simply* [l] with *rhythmy* [ŋ]). As for the noun-verb contrasts with the suffix *-ing*, the verbal base word might determine the existence of analogical present participles, but not derived nouns.

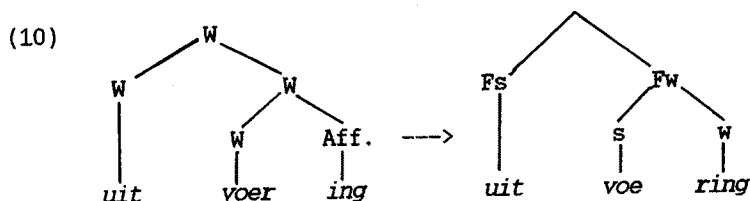
- (8)a. *uitzichtloos* ['ɛytzixt.,lo:s] 'prospect-less'
vijandschap ['vɛjant.,ʃap] 'hostility'
potloodachtig ['potlo:t.,axtik] 'pencil-like'
- b. *kinderlos* ['kindɔr.,lo:s] 'childless'
Wirtschaft ['virt.,ʃaft] 'economy'
besenartig ['be:zn.,artiq] 'broom-like'

Class II also contains a number of unstressed suffixes, which cannot undergo gapping (9a) and which are syllabically integrated with the preceding stem (9b). Analogous examples from German are given in (9c) and (9d).

- (9) a. *[[*blauw*]--] *en* [[*rood*]ig] 'bluish and reddish'
 *[[*absurd*]--] *en* [[*banal*]iteit] 'absurdity and banality'
- b. *uitvoering* ['ɛytfu:.riŋ] 'performance'
afzender ['afsɛn.dɔr] 'sender'
- c. *[[*gelb*]--] *und* [[*rɔt*]lich] 'yellowish and redish'
 *[[*Absurd*]--] *und* [[*Banal*]ităt] 'absurdity and banality'
- d. *Aufführung* ['auffü:.ruŋ] 'performance'
Absender ['apsɛn.dɔr] 'sender'

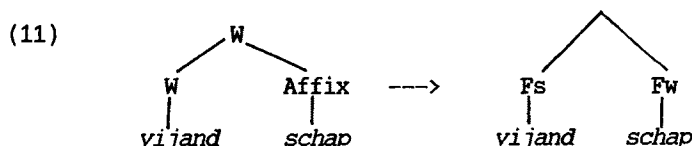
3. THE DOMAIN OF LEXICAL SYLLABIFICATION. Due to these and other problems, some linguists have abandoned level-ordered morphology and its intermingled phonological and word formation rules and returned to separate morphological and phonological components (e.g. Rubach 1984, Booij and Rubach 1984, Kooij 1985, Szpyra 1989, Inkelas 1989). Morphological words are mapped onto prosodic words which constitute the main domain for phonological rule application.

Thus Kooij and van der Niet 1985 account for the behavior of Dutch Class II suffixes by proposing a mapping of the derived morphological structure onto a derived prosodic structure which makes use of the category 'foot' and the labels 'strong' and 'weak', as illustrated in (10) for the word *uitvoering* 'performance' (their (5)).

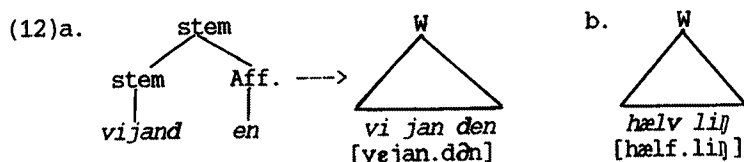


The 'weak, unstressed suffix -ing prosodically integrates with the preceding stem' (p.108), where prosodic integration covers both accentual and syllabic inclusion. The strong suffixes illustrated

in (8) above, on the other hand, are said to constitute separate feet, as shown in (11).



A similar account is given in van der Hulst 1984. The unit phonological (or prosodic) word is posited as the domain for lexical syllabification. A phonological word is defined as (1) a stem which does not dominate another stem, (2) a prefix, and (3) a suffix belonging to a set which are lexically specified as constituting a phonological word. Suffixes not marked [+w] (where w = phonological word) are 'integrated into ("cliticized" to) the preceding phonological word' (p.66). Thus the word *vijanden* 'enemies' is said to undergo the mapping given in (12a). The suffix *-ling* in *halfling* 'half man, hobbit', on the other hand, is said to be specified [+w] and therefore form a phonological word and syllabification domain of its own (12b).



Thus, Kooij and van der Niet propose a distinction between so-called strong (stressed) Class II suffixes which form independent domains of syllabification and so-called weak (unstressed) ones which do not; and van der Hulst suggests an arbitrary diacritical distinction between suffixes which form independent prosodic units and others which do not.

As argued in Laeuffer 1985 for German, these accounts of English and Dutch miss the fact that the correct distinction to make is instead a phonological one between consonant- and vowel-initial suffixes. Moreover, as noted in Laeuffer 1985 for German, Mohanan 1986 for English, and others, there is also a morphological distinction at play between a following affix (as in suffixed words) and a following stem (as in prefixed and compound words).

Thus, the formative *-achtig* 'like', cited by Kooij and van der Niet to exemplify strong suffixes with secondary stress which are not syllabified with the stem (see (8a) above), is better analyzed as a compounding element, just as English *-like* and German *-artig* or *-echt* illustrated in (13a). These are likewise not syllabically integrated with the preceding stem (as shown for instance, by the devoicing of /d/ in *fremd* and the unreleased syllable-final /k/ and alveolar initial /l/ in *inklike*). Furthermore, they undergo the Compound Stress Rule, can be gapped

and occur as words, as in German *artig* 'well behaved', *echt* 'true, real' or English *worthy*, *like*. Hence syllabification does not carry over to a following stem, as also shown in many prefixed words ((13b), where [Λ] represents the syllable-final vocalized variant of German /r/). In formal terms the morphological bracket [forms a barrier (re)syllabification never crosses: [[*ink*][*like*]], [*mis*[*use*]]; this was formulated as the Prosodification Constraint in Rubach & Booij 1990.

- (13)a. English: *inklike* ['iŋk.,laik]
trustworthy ['trʌst.,wʌrði]
- German: *fremdartig* ['frɛmt.,artiç] 'foreign-like'
regenecht ['re:gn.,ɛçt] 'rainproof'
- b. English: *misuse* [mis'ju:z]
sublease ['sʌb,li:s]
dispair [,dis.'peð]
perambulate [pr'æmbjə,leit]
misalliance [,mis.ə'laiəns]
- German: *Abart* ['ap.,art] 'modification'
entartet [ɛnt'artət] 'degenerate'
Verein [fɛr'ain] 'union'
obliegen [op.'li:gn] 'be incumbent on'
enträtseln [ɛnt.'rät:səlɪn] 'to solve'

Second, in all three languages, syllabic integration does not just apply to unstressed vowel-initial suffixes (14a), but also to stressed ones (14b), as shown for a mixture of Class I, II, and inflectional suffixes.

- (14) Dutch:² a. *uitvoering* ['ytfu:.riŋ] 'performance'
afzender ['afsen.dər] 'sender'
vijanden ['vejan.dən] 'enemies'
- b. *muzikaal* [müzi'kʰa:l] 'musical'
mohammedaan [mo:haməd'da:n] 'Muslim'
dievegge [di'veyð] 'thief, fem.'
vijandin ['vejan'din] 'enemy, fem.'
- English: a. *stylish* ['stai.liʃ]
starry ['sta:ri]
drainage ['drei.nidʒ]
sailing ['sei.liŋ]

²The examples in a. are repeated from (9) above. The ones in b. are from Booij 1977 (his (5)) and Kooij 1985. See also Langeweg 1985.

	b.	<i>employee</i>	[ɛmplo.'ji:]	
		<i>Chinese</i>	[tʃai.'ni:z]	
		<i>grotesque</i>	[gro.'tʰesk]	
German:	a.	<i>Weisung</i>	['vai.zuŋ]	'direction'
		<i>freudig</i>	['froi.diç]	'joyful'
		<i>Zeugin</i>	['tsoi.gin]	'witness, fem.'
		<i>lesend</i>	['le:.zənt]	'reading, verb'
	b.	<i>Sadist</i>	[za.'dist]	'sadist'
		<i>legal</i>	[le.'ga:l]	'legal'
		<i>Salbei</i>	[zal.'bai]	'ointment'

Evidence for this syllabification comes the non-application in German and Dutch of syllable-final devoicing, and the non-application in English of syllable-final l-velarization and r-vocalization, as well as the aspiration of stressed syllable-initial voiceless stops in all three languages.

Similarly, not only are stressed consonant-initial suffixes not syllabically integrated, but neither are unstressed ones. And it is thus not a set of suffixes which has to be diacritically defined in the lexicon. Rather the right generalization is that ALL consonant-initial suffixes, in all three languages, form syllabification domains of their own, as shown in (15).

(15) English:	a.	<i>droplet</i>	['drop.lət]	
		<i>quickly</i>	['kwik.li]	
		<i>duckling</i>	['dʌk.liŋ]	
	b.	<i>stressless</i>	['stres.,lis]	
		<i>blissful</i>	['blis.,ful]	
Dutch:	a.	<i>halfling</i>	['half.liŋ]	'hobbitt' /halv-/
		<i>sloridiglijk</i>	['sloridik.lək]	'untidily'
		<i>lieflijk</i>	['li:f.lək]	'lovingly' /liev-/
	b.	<i>rookloos</i>	['ro:k.,lo:s]	'smokeless'
		<i>vijandschap</i>	['ve:jant.,ʃap]	'hostility'
German:	a.	<i>Gewerbler</i>	[gə'vɛrp.lɔr]	'dealer'
		<i>Säugling</i>	['zoik.liŋ]	'nursling'
		<i>fraglich</i>	['fra:k.liç]	'questionable'
	b.	<i>leiblos</i>	['le:p.,lo:s]	'lifeless'
		<i>Auglein</i>	['oik.,lain]	'eye, dim.'

The syllable-final obstruents in German and Dutch are devoiced; /l/ is alveolar in English, thus syllable-initial; and the stem-final stops are unreleased. These cues signal a syllable boundary between stem-final and suffix-initial consonants, although they constitute permissible onsets.

Thus, in all three languages, vowel-initial suffixes of Class I, II, and inflectional suffixes are syllabified with the preceding morpheme (14), and consonant-initial ones are not (15).

4. THE DOMAIN OF LEXICAL SYLLABIFICATION REVISITED. The theory of cyclic syllabification reapplying after each affixation and blind to morphological structure advocated by level-ordered morphology does not produce the right results with consonantal suffixes, as exemplified with the German word *fraglich* compared to *Zeugin* which has a vocalic suffix (16). Prior to affixation /g/ is syllable-final in both roots (or extrametrical in some proposals, e.g. Borowsky 1986). Following affixation it is syllabified as (part of) an acceptable German onset with the suffix.

(16)	Level 1:	<i>Zeug.</i>	<i>frag.</i>
	1. Affixation:	-----	-----
	2. Syllabification:	-----	-----
	Level 2:		
	1. Affixation:		[[<i>frag.</i>]lich]
	2. Syllabification:		<i>fra.glich</i>
	Level 3:		
	1. Affixation:	[[<i>Zeug.</i>]in]	
	2. Syllabification:	<i>Zeug.in</i>	
	Postcyclic:		
	1. Devoicing:	-----	-----
		[tsoi.gin]	*[fra:.gliç]

Hall 1992 saves the cyclic account by dividing onset formation into two rules following Steriade 1982, Levin 1985, Rubach 1990, and Rubach & Booij 1990: one universal CV formation rule which attaches a single pre-nuclear consonant with the nucleus, and a language-specific onset formation rule which attaches another consonant (remaining consonants like word-initial *ʒ* are adjoined later). As shown in (17), the first rule applies to suffix-initial /l/ in *fraglich* and to stem-final /g/ in *Zeugin*, changing the latter's syllabification from final to initial. The second rule is prevented from associating /g/ in *fraglich* to the suffix by the ad hoc stipulation that it is only a structure BUILDING rule and thus cannot CHANGE preexisting syllable-structure.

This account runs into difficulties with words derived from stems ending in obstruents plus syllabic sonorants (e.g. *Nebel* 'fog', *wider* 'against', *Wagen* 'car'), following recent accounts of German schwa as a nonunderlying segment introduced through epenthesis in explicit speech contexts (e.g. Giegerich 1985, Wiese 1988). As shown in (17) for *neblig* 'foggy', where *L* represents an extrasyllabic /l/, in such words the whole cluster gets syllabified with the vowel-initial suffix. A postcyclic language-specific resyllabification rule is therefore posited to move the obstruent in such tautomorphic clusters over to the suffixal syllable, but not in heteromorphic ones like in *fraglich*.

This account has some serious drawbacks: instead of being one

single language-specific process, onset formation contains separate rules with very different and apparently ad hoc characteristics (merely structure-building versus also structure-changing). Furthermore, the account does not generalize to all derived words, but an ad hoc language-specific postcyclic resyllabification process has to be posited just to account for derivatives of stems ending in syllabic sonorants. A more general and insightful account is thus called for.

(17)	Level 1:	<i>Zeug.</i>	<i>frag.</i>	<i>neb.L</i>
	1. Affixation:	----	----	----
	2. Syllabification:	----	----	----
	Level 2:			
	1. Affixation:		[[<i>frag.</i>] <i>lich</i>]	[[<i>neb.L</i>] <i>ig</i>]
	2. Syllabification:			
	CV rule:		<i>frag.lich</i>	<i>neb.lig</i>
	Onset rule:		-----	-----
	Level 3:			
	1. Affixation:	[[<i>Zeug.</i>] <i>in</i>]		
	2. Syllabification:			
	CV rule:	<i>Zeug.in</i>		
	Onset rule:	-----		
	Postcyclic:			
	1. Resyllabification:	-----	-----	<i>ne.blig</i>
	2. Devoicing:	-----	<i>fra[k].lich</i>	-----
		[<i>tsoi.gin</i>]	[<i>fra:k.liç</i>]	[<i>ne:bliç</i>]

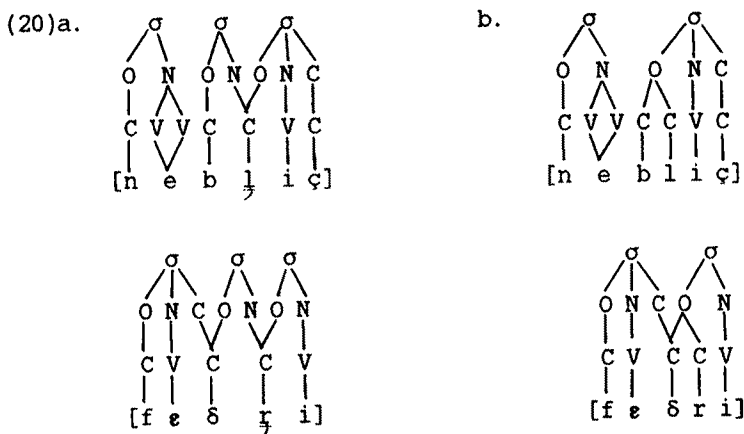
Suppose that in all three languages the domain of syllabification is the 'morpheme' which subsumes the categories Root and Affix. Cyclic application of syllabification can be preserved provided it respects morphological structure. In formal terms, syllabification is sensitive to morphological brackets. In other words, since consonantal suffixes form syllabification domains of their own, we may assume that vocalic suffixes initially do so too. At the postcyclic level syllable structure is then adjusted before vowel-initial, but not before consonant-initial suffixes. The derivations of German *Zeugin* and *fraglich* are shown in (18).

(18)	Level 1:	<i>Zeug.</i>	<i>frag.</i>
	1. Affixation:	-----	-----
	2. Syllabification:	-----	-----
	Level 2:		
	1. Affixation:		[[<i>frag.</i>] <i>lich</i>]
	2. Syllabification:		<i>frag.lich</i>
	Level 3:		
	1. Affixation:	[[<i>Zeug.</i>] <i>in</i>]	
	2. Syllabification:	<i>Zeug.in</i>	
	Postcyclic:		
	1. Resyllabification:	<i>Zeug.in</i>	-----
	1. Devoicing:	-----	<i>fra[k].lich</i>
		[<i>tsoi.gin</i>]	[<i>fra:k.liç</i>]

As in English a number of stems ending in syllabic sonorants have two pronunciations, illustrated in (19) for German *neblig* (also spelled *nebelig*). In the syllabic pronunciation resyllabification applies to syllabic /l/ which thus becomes ambisyllabic between the nucleus of the second syllable and the onset to the third syllable. In the nonsyllabic pronunciation, resyllabification consists in syllabifying with the suffix as many consonants as constitute a permissible medial onset. /l/ is thus syllabic until the whole medial cluster is resyllabified at the postcyclic level.

(19)	Level 1:	<i>ne.bl.</i>	<i>ne.bl.</i>
	1. Affixation:	-----	-----
	2. Syllabification:	-----	-----
	Level 2:		
	1. Affixation:	[[<i>ne.bl.</i>]ig]	[[<i>ne.bl.</i>]ig]
	2. Syllabification:	<i>ne.bl.ig</i>	<i>ne.bl.ig</i>
	Postcyclic:		
	1. Resyllabification:	<i>ne.blig</i>	<i>ne.blig</i>
	2. Devoicing:	<u>ne:.bliç</u>	<u>ne:.bliç</u>

The two pronunciations are illustrated in greater detail in (20) for German *neblig* and English *feathery*, following Clements & Keyser's 1983 representation of syllable structure.³



It is not clear how Hall 1992 would account for the pronunciations with syllabic consonants. Thus in (17) above, /l/ in *Nebel* is extrasyllabic on Level 1, that is, nonincorporated into syllable structure. On Level 2, it falls within the structural description

³It is not clear how models which replaced CV elements by X's unspecified for syllabicity could account for the syllabic pronunciation.

of the co-called CV rule and gets automatically syllabified as (part of) the onset to the suffix.

Rubach 1990 posits a postcyclic rule of sonorant desyllabification to prune the syllable node above the syllabic consonant. By ordering devoicing before desyllabification and the postcyclic reapplication of syllabification, he obtains Han[d].lung, e[b].nen, ne.blig/ne[b].lig.

- (21)
- | | | |
|-------------|--------------------|----------------|
| | | Han.d]. |
| Level 3: | affixation: | [[Han.d].]ung] |
| | syllabification: | Han.d].ung |
| Postcyclic: | devoicing: | ----- |
| | desyllabification: | Han.DL.ung |
| | syllabification: | Hand.lung |
| | | [hand.luŋ] |

On Level 3 syllabification does not syllabify /l/ with the suffix vowel because /l/ is itself a nucleus. Desyllabification renders the cluster extrasyllabic, until the reapplication of syllabification reintegrates it. The major drawbacks of this account are the extrinsic ordering in the postcyclic component and the generation of surface forms with voiced syllable-final obstruents.

The loss of a historical schwa and subsequent syllabicity of the following sonorant seems to have led in words derived from simplex words like *Handel* 'trade' to a relaxation of the well-formedness conditions on syllable structure in word-medial position. Thus, /dl/, unacceptable word-initially, is nevertheless found medially and, using Rubach's rules, the derivation of *Handlung* would rather be as shown in (22):

- (22)
- | | | |
|-------------|--------------------|------------|
| | | Han.d].ung |
| Postcyclic: | desyllabification: | Han.DL.ung |
| | syllabification: | Han.dlung |
| | devoicing: | ----- |
| | | [han.dluŋ] |

The restriction of resyllabification (RS) to PERMISSIBLE medial onset clusters is illustrated in (23a) for roots ending in nonsyllabic consonants and in (23b) for roots ending in syllabic consonants.

- (23)
- | | | | |
|--------------|--------|------------|--------------------------|
| | RS | | |
| a. Zeug.in | -----> | Zeu.gin | |
| Land.ung | -----> | *La.ndung, | Lan.dung 'landing' |
| Jagd.en | -----> | *Ja.gden, | Ja[k].den 'hunting, pl.' |
| b. neb[l].ig | -----> | ne.blig | 'foggy' |
| eig[ŋ].e | -----> | ei.gne | 'own, fem.' |
| Hand[l].ung | -----> | Han.dlung | 'act' |
| eb[ŋ].en | -----> | e.bnen | 'to flatten' |

/nd/ and /gd/ in (23a) are not permissible clusters and are therefore heterosyllabic. /dl/ and /bn/ in (23b) are also impossible word-initially, but have apparently been accepted as onsets medially in words derived from stems ending in syllabic consonants following the loss of schwa (compare with monomorphemic words like *Leibnitz* [p.n] or *Edna* [t.n] containing no historical schwa).

The postcyclic resyllabification process posited here for English, German, and Dutch has to be qualified. First, it is not identical to a reapplication of the regular syllabification algorithm, since it is restricted to the environment before vowel-initial suffixes. It thus appears that regular syllabification applies continuously at the cyclic level, that is, during affixation, but not at the postcyclic or word level. Second, as shown in (13) above, resyllabification does not apply before vowel-initial stems, as in compounds or prefixed words. In other words, it crosses], but not [brackets, assuming with recent models that Bracket Erasure does not occur until the end of the postcyclic component (e.g. Rubach and Booij 1990). Third, though both resyllabification and Hall's CV rule can be ascribed to the general dislike in languages for medial syllables without onsets, the two cannot be conflated. The CV rule syllabifies a suffix-initial consonant with the suffix vowel or resyllabifies a single stem-final consonant with a vowel-initial suffix. As posited here, resyllabification, on the other hand, merely resyllabifies and applies to as many consonants as are allowed by the well-formedness conditions at work in a particular language.

Notice, however, that not in ALL languages is there evidence for lexical syllabification at the level of the morpheme. Consider the data in (24) illustrating Levels 1 and 2 prefixes from French (e.g. Johnson 1987), which has fixed word-final demarcative stress, not indicated here.

French has a rule of vowel lengthening before tautosyllabic voiced fricatives and /r/ (and before any consonant following nasal vowels). The lengthening is particularly important in stressed syllables, but it is also noticeable in unstressed syllables (e.g. Delattre 1951, Carton 1974). French also has an intersyllabic regressive voicing assimilation rule.

(24) a.transat	'transatlantic'	[[trans][at]	[trā.zat]
mésentente	'misunderstanding'	[[més][entente]	[me.zātā:t]
non-être	'non being'	[[non][être]	[nō.netr]
b.transmis	'transmitted'	[[trans][mis]	[trā:s.mi]
disgrâce	'disgrace'	[[dis][grâce]	[diz.gras]

The nasal in *transat* is short because it is syllable-final. The one in *transmis* is long because it is followed by a tautosyllabic consonant, since /sm/, not being a permissible onset, is divided between the two syllables. The final consonant of *dis-* has undergone regressive voicing assimilation from following syllable-initial /g/. The final consonants of *més-* and *non-* are so-called

'linking' consonants, that is, normally mute consonants which are overtly realized as onsets to a following vowel-initial stem or word under certain conditions.

(25) illustrates Levels 1 and 2 inflectional and derivational suffixes. Besides the phonological rules already mentioned, French also has a rule which opens the vowels /e/ and /ø/ to /ɛ/ before a tautosyllabic consonant.

(25)a.	<i>papetier</i>	'stationer'	[[<i>papet</i>]ier]	[papø.tje]	*[papet.je]
	<i>dépeceur</i>	'carver'	[[<i>dépec</i>]eur]	[depø.sœr]	*[depes.œr]
	<i>chevrier</i>	'goat-herd'	[[<i>chevr</i>]ier]	[ʃø.vrie]	*[ʃe:v.rie]
	<i>maîtresse</i>	'teacher, fem.'	[[<i>maîtr</i>]esse]	[mɛ.tres]	-----
	<i>fermier</i>	'farmer'	[[<i>ferm</i>]ier]	*[fɛ.rmier]	[fer.mje]
	<i>farceur</i>	'joker'	[[<i>farc</i>]eur]	*[fa.rsœr]	[far.sœr]
b.	<i>fondra</i>	'will melt'	[[<i>fond</i>]ra]	[fõ.dra]	*[fõ:d.ra]
	<i>devra</i>	'will have to'	[[<i>dev</i>]ra]	[dø.vra]	*[dɛ:v.ra]
	<i>papeterie</i>	'paper mill'	[[<i>papete</i>]rie]	[papø.tri]	-----
	<i>calera</i>	'will stall'	[[<i>cale</i>]ra]	*[ka.lra]	[kal.ra]
	<i>connerie</i>	'stupidity'	[[<i>conne</i>]rie]	*[ko.nri]	[kon.ri]

Predictably medial consonants which constitute permissible onsets are syllabified with a following vowel-initial suffix, as illustrated in the first set in (25a). Contrary to English, German, and Dutch, however, consonants are also syllabified with a consonantal suffix if they constitute possible onsets: indeed preceding vowels are not lengthened, nor is schwa closed to /ɛ/ in the first set in (25b). Thus, in French, stem-final consonants are syllabified with a following vowel or consonant-initial suffix. In other words, syllabification does not respect morphological structure. The word constitutes the domain of lexical syllabification, whereas in the other three languages it is the morpheme, except for the postcyclic adjustment of syllabification before vowel-initial suffixes.

Now, one must now ask whether it is entirely arbitrary which languages syllabify like French and which ones syllabify like the other three languages. In other words, is it true that the domain of lexical syllabification has to be stipulated for each language, or can it be deduced from some more general difference(s) between these languages?

5. OTHER DIFFERENTIATING FACTORS. It seems that the domain of lexical syllabification follows from the more general role played by morphological structure in the language. In the languages examined here, the main difference is that in English, German, and Dutch the morphemic constitution of a word is crucial for the assignment of lexical stress. In French, on the other hand, the place of stress can be deduced from the limits of words, without

regard for morphological considerations: morphemes do not have any accentual properties.

In the former languages morphemes do have accentual properties and the place of stress cannot be deduced from the boundaries of words, but from their morphological make-up: 'L'accent de mot n'est que la réalisation des virtualités accentuelles des morphèmes qui le composent' (Garde 1965:33). A morpheme is defined not only by its phonemic make-up and its syntactic and semantic properties, but also by a particular stress pattern. When several accentuable morphemes are combined into words, the effect of stress rules is to characterize the resolution of the conflict (some morphemes seeing their stress reduced to secondary stress, others to weak stress, etc.).

Now, although Garde himself is not concerned with syllabification, it seems reasonable to assume that the different role of morphology with respect to stress is also reflected in the way languages syllabify. Thus, in the absence of counteracting factors, languages in which morphology plays no role in stress assignment, would also carry out syllabification without regard for morphological structure. Indeed, in such languages with so-called 'fixed' accent like French, Czech, or Polish, the word, rather than the morpheme constitutes the domain of lexical syllabification; similarly for languages which do not seem to have lexical stress. On the other hand, languages in which morphology does play a role in stress assignment tend to syllabify within the domain of the morpheme.

As more languages are looked at, one would expect additional morphology-related differences with an incidence on syllabification to come to light. For instance, in agglutinative languages or languages with vowel harmony or consonant gradation, in which morphological structure thus also plays a crucial role, lexical syllabification likewise appears to respect morphological divisions, in the absence of counteracting factors. Thus, the domain of lexical syllabification in Turkish and Finnish can be analyzed as being the morpheme with resyllabification before vowel-initial suffixes (e.g. Turkish *Araplar* 'Arabs' [[arab]lar] -> [ara[p].lar], *kürkü* 'fur, gen.' [[kürk]ü] -> [kür.kü]), although the restriction that medial syllables begin with single consonants makes the word an equally plausible domain, supported by the fact that these languages have fixed demarcative stress.

6. CONCLUSION. It has been claimed that the morphological category type or level that serves as a domain for rules constructing phonological representation is a parameter along which languages differ (e.g. Selkirk 1982).

A cross-linguistic comparison is consistent with proposals that syllabification applies cyclically to roots and reapplies after each word formation process to incorporate newly added elements. However, in some languages syllabification is sensitive to morphological structure, while in others it is not. Thus, the

domain of lexical syllabification is the morpheme in some languages and the word in others.

In the former type language syllabification undergoes an adjustment postcyclically to create onsets for marked vowel-initial suffixes. This restricted resyllabification process does not cross [brackets and extend to vowel-initial stems in prefixed or compound words.

It appears that no language-particular stipulation has to be made to account for the difference in the domain of lexical syllabification. Instead it can be linked to other crucial differences between these languages, in particular, to the general role morphology plays. Thus, languages in which morphology plays no role in stress assignment or is otherwise not prominent also carry out syllabification without regard for morphological structure. On the other hand, languages in which morphology does play an important role tend to syllabify within the domain of the morpheme.

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V
SYNTAX

ADVERBIAL BUT

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While reading my students' essays, I occasionally discover structures that seem to be "errors" built on analogy, as in sentences like (1a-c).

1. a. But, do parents really have control over their children's television viewing habits?
- b. But, no matter what you say there is bound to be problems with people like that.
- c. But, in reality people rarely say what they feel.

The choice of a sentence-initial conjunction is interesting, given that many students have had years of proscriptive language instruction forbidding that structure. However, the choice of a comma after the conjunction is especially interesting, punctuating the conjunction but as if it were an adverb like however. Is this only a case of confusion -- extending the punctuation of conjunctive adverbs to their corresponding coordinators? Or does a structure like that mean something more? I believe it means more.

It seems to me that the coordinator but (with some other conjunctions and conjunctive adverbs) in sentence-initial position is undergoing a semantic reanalysis in contemporary written American English. Imagining a gradient between the word classes COORDINATOR and ADVERB, I hope to show that coordinators and conjunctive adverbs are "moving" along that gradient. Sentence-initial coordinators like but, so, and or increasingly exhibit the distributional, syntactic, and semantic properties of adverbs, while sentence-initial conjunctive adverbs like therefore, however, and plus increasingly exhibit the properties of coordinators and subordinators. Similar gradients exist between SUBORDINATOR and ADVERB as well as between COORDINATOR and SUBORDINATOR.

Before examining this claim in greater detail, however, let's outline the uses of the word but. Modern English exhibits three distinct senses of but.

Prepositional but: but₁

The but used as a preposition is close in semantic force to, and exists in a paradigmatic set with, the preposition except, cf. sentences (2-4) below.

2. Everyone has left but Tom.
3. All but two are missing.
4. There but for the grace of God go I.

Focusing Adverbial but: but₂

Furthermore, there is an adverbial use of but similar in function and meaning to the focusing adverb only, cf. sentences (5-6). Early Modern English also demonstrated a use of but as a relative pronoun that focused emphatically on the information of the following clause, cf. sentences (7-8). This use of but has all but disappeared in contemporary English.

5. A simple sentence contains but one clause.
6. It was but one step on the road to ruin.
7. There is not a university in the area but follows public opinion in fear and trembling.
8. Surely there isn't a mother but faces this problem.

Coordinator but: but₃

Far more frequent, however, is the use of but as a coordinator, cf. sentences (9-11). The usual syntactic hallmarks of the coordinator in English are its restriction to clause-initial position; its ability to fix clauses sequentially; its ability to conjoin constituents of equal rank at different grammatical levels -- word, phrase, and clause -- as in (9-11); its ability to link subordinate clauses; its ability to link more than two clauses; and, in the case of but, its ability to imply a sense of contrast or negation between the conjoined constituents, as in (9-11) again.

9. She is small but strong.
10. She is painfully strict but extremely fair.
11. She demands a lot, but she gives a lot in return.

The sense of negation is so strong with the coordinator but that it frequently collates with a negative element, as in (12-14).

12. It is rare but not uncommon.
13. The request seems silly but is not unreasonable.
14. He finally left, but not before he spoke his mind.

Most of the literature on *but* has focused on the theoretical problems presented by the semantic subtleties of this conjunction. Lakoff (1971) outlined the significant syntactic and semantic differences between the 'denial of expectation' and the 'contrast' senses of *but*. Arguing that context plays a role only in the interpretation of the 'denial of expectation' sense, Lakoff concluded that one cannot maintain a distinction between semantics and pragmatics. In response to Lakoff, Dascal and Katriel (1977) suggested that both interpretations of *but* must make reference to context, formulating a single rule of interpretation from which the contrast and denial senses form special cases. Wilson (1975) and Blakemore (1989) furthered that discussion by demonstrating that the semantics of *but* cannot be captured adequately by truth-conditional semantics, opting instead for a different theoretical stance -- the principle of relevance.

Indeed, Blakemore (1989) employs the principle of relevance to collapse the denial and contrast senses of *but*. Both senses, she reasons, are derived from a single implication conveyed by *but*, the notion of denial: the different senses arise as a consequence of different constraints on the interpretation of that implication. If the constraint is on the relevance of the proposition *but* introduces, then the result is the 'denial of expectation' interpretation. If the constraint is on the relevance of the conjunction of the two propositions it connects, then the result is the 'contrastive' interpretation.

Coordinators as Adverbials: *but*₄ and similar structures

It seems to me, however, that the coordinator *but*₃ no longer appears exclusively in sentence-medial position, where all right-minded prescriptivists have confined it. Indeed, the coordinator *but*₃ occurs with ever increasing frequency in sentence-initial position, cf. Quirk et al. (1985:1462-63). I suggest though that along with this distributional shift in the coordinator *but*₃, there are semantic shifts as well. And so *but*₄ emerges, the adverbial *but*.

The hallmarks of the adverbial *but* are syntactic and semantic in addition to the obvious distributional difference. Syntactically, *but*₄ does allow some minor reordering of clauses (as in 15-16 where columnist Roger Simon is discussing his reactions to a television documentary about drunken driving) and is mobile within the clause for a several English speakers, cf. (17-18). The adverbial *but*₄ no longer links subordinate clauses because of its distribution in sentence-initial

position. Further, but₄ never conjoins constituents below the rank of clause, cf. (19-21). Finally, the adverbial but₄, unlike true coordinators, is not restricted to linking constituents of equal rank, cf. (19-21) again, where the adverbial but₄ demonstrates a link between its clause and the whole of the preceding paragraph.

15. I did not react as Phil Donahue, the host, did when he came on at the end and said: "I was enormously moved by this documentary, as I'm sure you were." ...
I was plenty moved for the people who were crippled, paralyzed, reduced to vegetables, or killed. But the drunk drivers themselves did not move me. (Roger Simon, "No Compassion for Drunk Drivers")
16. I did not react as Phil Donahue, the host, did when he came on at the end and said: "I was enormously moved by this documentary, as I'm sure you were." ...
But the drunk drivers themselves did not move me. I was plenty moved for the people who were crippled, paralyzed, reduced to vegetables, or killed.
17. The job's still not done: I'll finish her this avo, but. (informal Australian English, where adverbial but means 'however', cf. Quirk et al. 1985:21)
18. I didn't do it, but. (informal Irish English, where adverbial but means 'all the same', cf. Quirk et al. 1985:644)
19. Sometimes they go to jail and sometimes they lose their licenses and sometimes they lose their jobs, we are told.
But, in reality, they rarely do. Most drunk drivers get away with it. (Roger Simon, "No Compassion for Drunk Drivers")
20. College teaches a person many things. Some of the lessons are seemingly unimportant, such as using a verb in a sentence. Others are vital, such as how to tap a keg. But college learning extends beyond the classroom and the bar.... (Pat Healy, "The Poor Slob")
21. Should the content of the research work ... be further specified? No. But there had better be some content, a substance... (faculty memo)

Semantically, the coordinator but₃ strongly implies contrast or negation, whereas the hallmark of the adverbial but₄ is its implied concession. (See Martin (1983) for a systematic description of the

concessive sense of several of the coordinators, subordinators, and conjunctive adverbs discussed here, including but.) Through its ability to imply concession, the adverbial but₄ in contemporary American English is moving in the direction of the adverbial but in Australian and Irish English illustrated in (17-18). The easy possibility of paraphrase, substitution, by concessive adverbials like however and all the same or by concessive conjunctions like yet, though, and although lends support to this semantic analysis, cf. (22-26) where I have added the paraphrase for comparison. Compare also (27-29), where the ungrammaticality of paraphrase with coordinator but₃ further suggests that concessive meaning belongs only in the domain of the adverbial but.

22. He was sentenced to two years of unsupervised probation, fined \$500 and ordered to produce a documentary on the results of drinking and driving.
 But{However/All the same/Though} having seen his documentary, I get the impression that one of the big results of drinking and driving for Burke was getting exposure on national TV. (Roger Simon, "No Compassion for Drunk Drivers")
23. ... "he didn't mean it; he didn't even remember it happening."
 But{However/All the same} didn't he mean it? Don't all drunk drivers mean it? (Roger Simon, "No Compassion for Drunk Drivers")
24. I admit my reaction to drunken driving is extreme. But{All the same/, although} Burke and I do agree on one thing. (Roger Simon, "No Compassion for Drunk Drivers")
25. I'd like to claim that the paragraph that submits to this kind of structural analysis is thereby a good paragraph and the only good paragraph. But{Yet/All the same/, although} I only claims that the structural relations are real (Francis Christensen, "A Generative Rhetoric of the Paragraph")
26. I used to think that we should mold 102
 But{, though} I'm not so sure anymore. (faculty memo)
27. She is small but{*although/*all the same} strong.
28. She is painfully strict but{?however/*all the same/?though} extremely fair. [The meaning of this example changes from the implied contrast of but to one of implied concession with though or however.]
29. She demands a lot, but{?however} she gives a lot in return. [Again, the meaning changes from

implied contrast to implied concession with
however here.]

To reinforce the semantic analysis presented here still further, notice that many other sentence-initial conjuncts take on concessive force, as in (30-32).

30. Whatever contributes to the student's developing an independent outlook [should be accomplished in English 102]. Perhaps this cannot be done within an institution. So perhaps the requirement is impossible. (faculty memo)
31. I envision a series of papers written on the way to the research paper -- a series of personal essays, anecdotes, events, observations from experience and readings -- these papers then can willy nilly be reassembled and rewritten to produce a final major research paper. And that in turn should be subjected to a full global rewriting. (faculty memo)
32. As the world is constituted, the demands of a married state and the care of a posterity require some little regard to what we call circumstances. Yet this provision is greatly increased ... by folly and vanity.... (Henry Fielding, Tom Jones, I, xii)

Furthermore, punctuation, especially the use of a comma after the conjunction, provides the another bit of evidence that these writers are responding to the adverbial, concessive force of the conjunction in informal usage. Compare (1a-c) again and (33-36).

33. And, Stericycle conducts first part of its plant test on mechanical equipment. ("Stericycle Timeline" in The Journal Times)
34. But, one type of student is almost always liked by the other dormmates. (Pat Healy, "The Poor Slob")
35. Yet, to require such content would be difficult in light of our other efforts to incorporate motivation and variety... (faculty memo)
36. We will continue to find reliable students aides to work during the week to make the deliveries. Whereas, every attempt to made [sic] to deliver equipment to your class, we rely on student aides. (faculty memo)

There is one final demonstration of the semantic differences between the conjunct but₃ and the adverbial but₄. Blakemore (1989) and others have noted that the conjunct, expressing a denial of expectation, can be paraphrased by although X, Y if and only if Y expresses

a conclusion contradicting the inference based upon X. However, X although Y is not an adequate paraphrase. Using this test, compare the contrast meaning of the conjunct but in (37a-c) to the concessive meaning of the adverbial but in (38a-c).

37. a. She is rich but honest.
 b. = Although she is rich, she is honest.
 c. $\neq$ She is rich, although she is honest.
38. a. I don't know what the content should be. But there had better be some content.
 b. = Although I don't know what the content should be, there had better be some content.
 AND
 c. = I don't know what the content should be, although there had better be some content.

The acceptability of both (38b and c) demonstrate that the implicational relations that hold true between propositions linked by the coordinator but do not apply to the use of but in (38). This seems to suggest that the but in (38) functions less as a coordinator and more as an sentence-initial adverbial, conveying a sense of concession.

I realize at this point that one might object to the data presented so far: it is too biased, too filled with the informal language of journalism and faculty memoranda. I use those sources for two reasons: first, contemporary journalism is filled with examples of sentence-initial but and so it became the path of least resistance. Secondly, there seems to be some statistical discrepancy between the formal prose of faculty members and their informal prose.

So that I might counter those objections more fully, note the following tables. Table 1 presents the frequency of the word but in a corpus of English 101 essays, prepared and revised by eighty-seven College of DuPage students, with a median age of nineteen, fifty percent female, fifty percent male.

TABLE 1:
Frequency of but in 101 essays

sentence-initial <u>but</u>	68	17% of all <u>but</u> s
other clause-initial <u>but</u>	192	48% of all <u>but</u> s
total tokens of <u>but</u>	398	0.3% of the total words
total words in 101 corpus		114,000

Table 2 presents the frequency of the word but in a corpus of scholarly essays, a conference paper written by a College of DuPage faculty member (Frances Fitch, "Bloom and a Vichican Practice of Advertising,"

a paper presented at the International Joyce/Vico Conference, Venice, Italy, June 1985), two articles that appeared recently in PMLA (Ellen McCracken, "Metaplagiarism and the Critic's Role as Detective," PMLA 106 (1991) 1071-1082 and Marie Borroff, "Sound Symbolism as Drama in the Poetry of Robert Frost," PMLA 107 (1992): 131-144), and one article of mine (Daniel Kies, "Fourteen Types of Passivity: The Suppression of Agency in Nineteen Eighty-Four," The Revised Orwell. Ed. Jonathan Rose, East Lansing, MI: Michigan State University Press, 1992, 47-60).

TABLE 2:
Frequency of but in scholarly essays

sentence-initial <u>but</u>	10	7.8% of all <u>but</u> s
other clause-initial <u>but</u>	58	45% of all <u>but</u> s
total tokens of <u>but</u>	128	0.2% of the total words
total words in scholarly corpus	56,000	

Table 3 illustrates the use of the word but in the Brown University corpus of written American English (Francis and Kucera 1982). The Brown corpus of more than a million words selected examples of prose from a variety of genres and registers. Notice that in terms of overall frequency of use, the 101 student and the scholar are not significantly different from what might be considered a norm for written American English; indeed, it seems that 'academic' writers of all kinds are a bit more conservative in their frequency of usage.

TABLE 3:
Frequency of but in the Brown University corpus

total tokens of <u>but</u>	4226	0.4% of the total words
total words in Brown corpus	1,013466	

Table 4 presents some astonishing results. Journalists seem to prefer the sentence-initial but. The pieces of newspaper journalism in the corpus were chosen randomly from a mixture of eight front page stories, six editorials, and four columns collected between November 10 and December 13, 1990. The newsmagazine pieces were four randomly chosen Time and Newsweek cover stories during the same period.

TABLE 4:
Frequency of but in journalism samples

sentence-initial <u>but</u>	48	61.5% of all <u>but</u> s
other clause-initial <u>but</u>	24	31% of all <u>but</u> s
total tokens of <u>but</u>	78	0.4% of the total words
total words in journalism corpus	17,600	

The statistics in Table 4 would seem to suggest journalism as a source of the composition students' relatively more frequent use of the adverbial but. The students may be analogously generalizing the use of but, despite the practice and the prescriptivism of their teachers. But that explanation, as simple and intuitively right as it seems, can not be the whole story. First, the demographics of newspaper and magazine readerships weigh against that explanation: news readers are largely an older group. Secondly, the statistics in Table 2 do not represent college instructors' practice quite accurately.

So consider Table 5, where the statistics represent the (informal) prose of several faculty members (mostly English department members) at the College of DuPage.

TABLE 5:
Frequency of but in faculty memos

sentence-initial <u>but</u>	8	14% of all <u>but</u> s
other clause-initial <u>but</u>	30	52% of all <u>but</u> s
total tokens of <u>but</u>	58	0.4% of the total words
total words in faculty memo corpus	16,150	

The numbers in Table 5 are very close to the corresponding numbers of 101 students in Table 1. This result suggests that faculty members exhibit a classic case of divided usage: formally they write conservatively, prescriptively, but informally they accept -- and use -- sentence-initial conjunctions.

To explore the range of this divided usage further, I prepared a fifty page booklet as part of an acceptability study. Each page of the booklet contained a short discourse (two to four sentences) that illustrated the use of coordinators, subordinators, and conjunctive adverbs in sentence-initial, -medial, and -final position. The respondents were students and faculty at the College of DuPage, and they were fully aware of the intent of the survey. Each page asked the respondents to evaluate the short discourse twice, answering 'yes' or 'no' to the same two questions each time: "I have seen this use of _____" and "I have used _____ this way myself." The

blanks were filled with the appropriate conjunction or adverb illustrated on the page.

Tables 6 and 7 present some of the result of the survey. Note in Table 6 that faculty both recognize and use the sentence-initial but frequently. This result, I suggest, more closely conforms to the practice of faculty revealed in Table 5, and accounts for the similar numbers in the students' prose (Table 1). Interestingly, Table 7 indicates that students claim to recognize and to use comma punctuation after sentence-initial buts more frequently than faculty. Those numbers are not borne out by the data in the corpus study of 101 prose. Of the sixty-eight sentence-initial buts in the 101 corpus, only two co-occurred with following comma punctuation. However, the students' claim itself, I suggest, argues in favor of their perception of sentence-initial buts as adverbials and argues in favor of a shift of but₄ along a gradient away from CONJUNCTION and toward ADVERB.

TABLE 6:
Acceptability judgments of sentence-initial but
without comma punctuation
(e.g. But I am not so sure anymore)

DuPage faculty	I have seen	27	90%
	I have used	18	60%
Total faculty in survey: 30			
101 students	I have seen	59	56%
	I have used	17	16%
Total students in survey: 105			

TABLE 7:
Acceptability judgments of sentence-initial but
with comma punctuation
(e.g. But, one type of student is almost always liked
by the other dormmates.)

DuPage faculty	I have seen	11	37%
	I have used	1	3%
Total faculty in survey: 30			
101 students	I have seen	28	27%
	I have used	9	9%
Total students in survey: 105			

The data in Tables 8 and 9 represent another shift in contemporary written American English: certain subordinators (such as when, which, although, though) and conjunctive adverbs (such as however, therefore, plus, then) are also on the move along gradients.

TABLE 8:
Acceptability judgments of sentence-final although
without comma punctuation
(e.g. I don't like pizza although.)

DuPage faculty	I have seen	9	30%
	I have used	0	0%
Total faculty in survey:	30		
101 students	I have seen	23	22%
	I have used	5	4%
Total students in survey:	105		

TABLE 9:
Acceptability judgments of sentence-final although
with comma punctuation
(e.g. I felt he was being honest, although.)

DuPage faculty	I have seen	9	30%
	I have used	0	0%
Total faculty in survey:	30		
101 students	I have seen	38	36%
	I have used	12	11%
Total students in survey:	105		

Although several faculty and students alike recognize 'sentence fragment' errors like those of Tables 8 and 9, no faculty member reports using such a structure. However, the students report using the structure, presumably finding the structure acceptable. Corpus studies do not support the students' usage claims again; only four sentence-final althoughs exist in the corpus, three preceded by comma punctuation. Nevertheless, their report of using it is suggestive about their attitudes towards its adverbial function and its acceptability in that function.

Subordinators as coordinators

Subordinate clauses generally present backgrounded (i.e., presupposed, given, or old) information, cf., Quirk, Greenbaum, Leech, and Svartvik (1985); Dillon (1981); and van Dijk (1977). Participial and verbless adverbial clauses, for example, possess no explicit marker of subordination, thereby creating semantic indeterminacy, which is usually resolved through context; e.g., the participial clause in (39a) is semantically equivalent to either (39b) with a relative clause or (39c) with coordination.

39. a. Jason, told of his son's accident, immediately phoned the hospital.
- b. Jason, who was told of his son's accident, immediately phoned the hospital.
- c. Jason was told of his son's accident and immediately phoned the hospital.

Such indeterminacy is not uncommon in subordination: "In their indeterminacy, adverbial participle and verbless clauses resemble the versatile relationships expressed by nonrestrictive relative clauses and the connective function of the coordinator and" (Quirk et al. 1985:1123). The indeterminacy of several conjunctions between coordinators and subordinators explains, I think, the increasing use of restrictive relative clauses punctuated as full sentences, cf. (40-41).

40. There was no marker to their memory, no record of their graves' precise location.

Which is why Hermes thought at first that the tangle of bones sticking out from the recently graded hillside were actually tree roots. (David Silverman, "Man's Walk with dog may be stroll into history")

41. The composer who from 1969 to 1976 declared a worldwide moratorium on performances of his music to protest what he called "all the rottenness in the world" has actually become sort of benign.

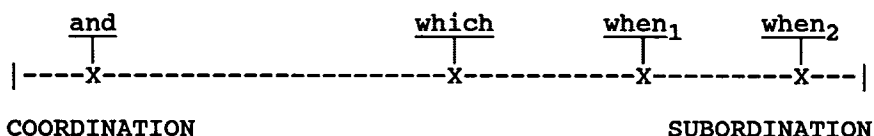
Which is not to say he has greatly curbed his tongue or his penchant for recycling his best anecdotes and one-liners. (John von Rhein, "Ralph Shapey turns mellow -- even toward the CSO")

Consider also these examples in (42-47) below as further evidence to support the semantic indeterminacy of the apparently subordinate clauses in (40-41). Some adverbial clauses exhibit a strong temporal restriction, similar to the temporal restriction on the coordinator and, suggesting a gradient of taxis between coordination and subordination.

42. He was lecturing to his class when suddenly a door flew open.
43. *When suddenly a door flew open, he was lecturing to his class.
44. He was lecturing to his class and suddenly a door flew open.
45. Suddenly a door flew open and he was lecturing to his class. [not the same meaning as (42)]
46. The car stopped when it hit the pole.
47. When it hit the pole, the car stopped.

As (42) and (43) demonstrate, some clauses with when are restricted to natural time order just as the clauses (44) and (45) with and are temporally restricted. But only the time sense of when in (42) and (43) is restricted like and. (Let when₁ represent the time sense of the word.) Consider the cause sense of when in (46) and (47). (Let when₂ represent the cause sense of the word.)

The examples in (40-47) suggest a gradient of clause connectors between coordination and subordination: and appears to be the best coordinator; relative conjunctions like which seem ambiguous between subordination and coordination (medial linkers); and the two when conjunctions are closer to subordination, although when₁ is closer to coordination than when₂ is, cf. Quirk et al. (1985:1258-59) and Kies (1990:231-58).



Adverbials as Conjunctions

Finally, it appears that conjunctive adverbs are on the move as well, along gradients between ADVERB and SUBORDINATOR and between ADVERB and COORDINATOR. Consider the examples in (48-56), which are given as informal, but acceptable, examples of conjunction in Curme's grammar of English.

48. There is not only concision in these lines, there is also elegance. (Curme 1931,2:164)
49. I do not suggest that he is negligent, still less (or much less) that he is dishonest. (OED)
50. You never fought with any, lesse slew any. (Ben Jonson, Magnetic Lady, III, iii)
51. First think, then act. (Curme 2:165)
52. My interests are two fold: on the one hand my flowers claim me in the morning, on the other (hand) I am absorbed in language studies the rest of the day. (Curme 2:165)
53. He is very poor, at least he has not the wherewithal to by proper clothes for his wife and family. (Curme 2:166)
54. Seize the chance, else you will regret it. (Curme 2:166)
55. He wanted to take precedence of all the Lowland gentlemen then present, only my father would not suffer it. (Scott, Waverly, Ch. XV)
56. He makes good resolutions, only he never keeps

- them. (Curme 2:167)
57. I saw the smoke behind them, then I realized it real fast.... (101 essay)
 58. You don't really have enough money to stay in a hotel, plus the car rental is draining your wallet. (101 essay)

The examples of conjunctive adverbs as conjuncts testify further that word class categories like SUBORDINATOR, COORDINATOR, and CONJUNCTIVE ADVERB do not have rigid boundaries. Needless to say, one need not read many college compositions before discovering that those categories do not have rigid boundaries in the language of 101 students either, as the many 'comma splice' faults readily testify, cf. (57-58).

Explanations and conclusions

I realize that the claims made here are large in scope while supported by only a small data set. Nonetheless, I believe that the data presented above support the conclusion that we have a classic example of divided usage in the case of COORDINATORS, SUBORDINATORS, and ADVERBS in sentence-initial position. Moreover, I see enough consistency in the data to make the following hypotheses, allowing us to test these claims about the existence of the adverbial but.

HYPOTHESIS 1: Thematic Distribution of Adverbial But
But₄ occurs as a strongly thematic element in complex themes.

Based on the work of Halliday (1967 and 1985) and Fries (1983), the first hypothesis stipulates that the adverbial but occurs in texts as a strongly thematic element in complex themes. Halliday and Fries both define a thematic cline between clause-initial elements that are weakly thematic and those that are strongly thematic. As Fries (1983) and Eiler (1986) point out, for any element to be strongly thematic, the speaker or writer must have a choice, and the data I have seem to allow adverbial but only as one choice of several. Further, Halliday and Fries both characterize theme in English so as to allow for both simple and complex themes, and I suspect that the adverbial but occurs in theme complexes, as is often the case with other sentence- and clause-initial adverbials.

HYPOTHESIS 2: Clause Relation Type of Adverbial But
But₄ occurs only in clause relations of the PROBLEM-SOLUTION type.

The research of Winter (1982), Jordan (1984), Hoey (1986), and Hoey and Winter (1986) into clause relations, the way in which clauses and sentences cohere within the larger text, suggests that well-formed texts maintain a metastructure, often consisting of four elements, Situation-Problem-Solution-Evaluation. The second hypothesis stipulates that adverbial but, with its ability to signal concession, is an overt marker of the transition from Problem to Solution. On the other hand, the conjunct, contrary to expectation but, signals the transition from Situation to Problem.

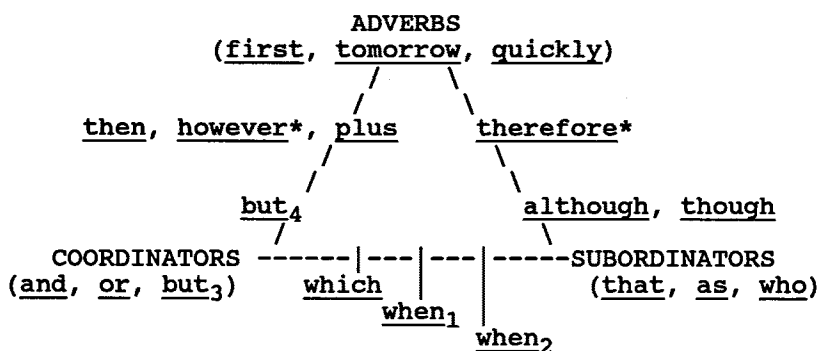
HYPOTHESIS 3: Reanalysis of Conjuncts and Adverbs
But is not alone in undergoing semantic reanalysis.

The few examples presented here seem to suggest a large scale reanalysis of several groups of word classes in modern English. The motivation for the usage problem seems to be the gradient nature of the items in those word classes. The gradients based on form classes might look something like (59) below.

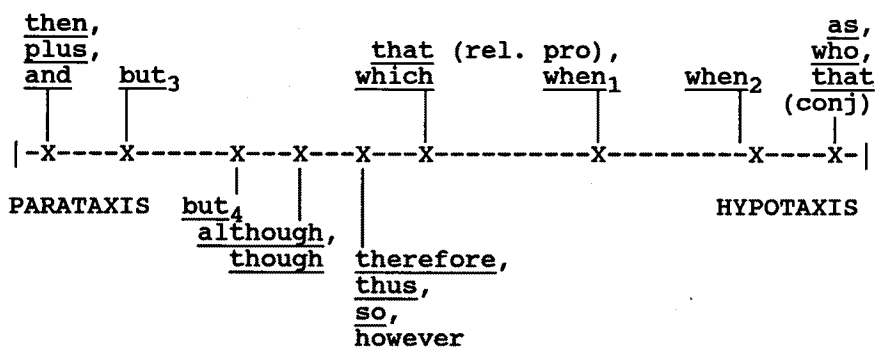
Yet the gradients in (59) conceal a problem, indicated by the asterisks after the words however and therefore. It is not certain that however is moving toward the COORDINATOR pole or that therefore is moving toward the SUBORDINATOR pole. I place them there only because of their semantic affinities to coordinators and subordinators respectively and because of a few syntactic similarities. Further research is needed to explicate fully the dimensions of those gradients.

One way to overcome the shortcoming of the gradient based on form classes is to look at the same phenomena from a functional point of view, as in (60). If we define PARATAXIS as the juxtaposition of clauses of equal information value and HYPOTAXIS as the juxtaposition of clauses where one clause is foregrounded informationally while the other is informationally backgrounded, then we can present the same data on a unified, function-oriented gradient.

59. Gradients based on form classes:



60. A gradient based on function:



This is an on-going change in the history of English. As Curme (1931,1:94) points out "Nothing in English grammar has changed so much within the Modern English period as our conjunctions." And historical hypotheses (like all hypotheses) need careful corpus research to justify any postulated explanation. I admit that much of what has been said here is suggestive and programmatic; however, earlier studies have neither adequately described nor explained these data. Blakemore, for example, completely misanalyzes cases of adverbial but. In an effort to bolster her hypothesis, Blakemore is forced to explain away counterexamples like A: My parents vote Labour B: But my parents vote Tory by ignoring them simply because they are "odd" (1989:31). To his credit, however, Martin (1983) does recognize the concessive interpretation conveyed by some sentence-initial buts. Yet, despite the scope and the very thoughtful analysis of his study, Martin fails to recognize the gradient nature of these items. Gradience is the central

concept, I believe, for resolving two problems Martin (1983:54-60) acknowledges in his study: explaining the process of grammaticalization assumed to be at work in English conjunction system and explaining the process of conjunction in English in addition to describing the system of English conjunctions.

Finally, I have tried to present the case for adverbial *but* in such a manner that the case is testable through the collection of a larger corpus. After all, as Yngve (1986) has pointed out, if linguistics is to be a science, that is the least I could do.

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DO NOT PEOPLE SAY SUCH THINGS?

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1. OPERATOR+NOT+S+PREDICATION QUESTIONS IN THE LITERATURE¹. Most if not all English grammars before 1980 recognized two forms of negative interrogatives (1-2):

- (1) Do people not say such things?
- (2) Don't people say such things?

Questions with an uncontracted *not* before the subject NP, as in the title of this paper, were held to be ungrammatical. In Kontra 1981 I demonstrated the existence of Operator+*not*+S+predication questions (*not*+S for short) on the basis of printed examples and six elicitation experiments. Specifically I claimed that questions like (3)

- (3) Is not linguistics really a branch of psychology?

occur when speakers want to use conducive questions without using contractions.

Quirk *et al.* (1985:809) have since recognized such constructions, while Celce-Murcia & Larsen-Freeman (1983:112-13) were rather reluctant to admit their grammaticality. These two grammars make the following specific remarks about questions like (3):

	Celce-Murcia & Larsen-Freeman	Quirk <i>et al.</i>
GRAMMATICALITY	ungrammatical	some speakers accept it
GRAMMATICAL DISTRIBUTION	limited: *Is not it a branch of psychology?	no remark
STYLE	very formal; rather archaic historical vestige; may occur in formal writing	rather formal; especially likely in formal contexts where the subject is lengthy; in print it may merely represent the printed equivalent of the attached enclitic

Perhaps unexpectedly, the best corpus-based variation study of English negation (Tottie 1991) does not mention the unordinary uncontracted negative question.

2. MORE ELICITATION DATA. In addition to examples from the King James Bible (1611) and The New Oxford Annotated Bible (1977), in Kontra 1981 I quoted several examples from printed academic essays by such contemporary linguists as Dell Hymes, Robert Austerlitz, David Seaman and Roger Lass as well as journalist William Shirer. Two recent examples, also by linguists, show that this relatively rare question-type continues to be well and alive in written English:

(4) Have not these disciplines developed in ways such that the question itself sounds as though it belongs to a former era?
(Crowley 1991:1)

(5) At the present time, the question might well be asked: do not all these corpus initiatives simply duplicate one another?
(Leech 1993:12)

My earlier elicitation tests sought to shed some light on the grammaticality, semantics, and stylistic value of all three kinds of negative interrogatives. Moreover, an investigation of the printed examples in context showed that in all cases the Operator + *not* + S + predication questions were conducive. The late Dwight Bolinger (personal communication 1981) suggested further avenues of research to me in a letter which is worth quoting at length:

'... There is an interesting correlation with the negatively marked indefinite pronouns and adverbs, which confirms the conduciveness. In a conversation like the following:

I'm afraid I can't leave now. — Why? Isn't your brother here yet?
the meaning is nonconductive: 'Is the reason the fact that your brother is not here yet?' If we uncontract the negative, we get

Why? Is your brother not here yet?

It would be unacceptable (even ungrammatical) to say

*Why? Is not your brother here yet?

But with a switch to *already* and a conducive interpretation, this arrangement is satisfactory:

Why? Is not your brother here already?

A similar effect with *any* and *some*:

*Had not anybody been there?

(OK only on the slim chance that *not-anybody* = *nobody*.) But OK

Had not somebody been there?

This also forces the 'any whatsoever' interpretation of *any*:

Would not anybody see that?

'Is it not the case that it would be perfectly clear to anyone whomsoever?'

Another point that I think would be worth pursuing is how the various auxiliaries react with this position of *not*. As your tests show, the full *not* is of doubtful colloquiality. But I think that *might* comes close to giving a colloquial sentence:

Might not almost everyone agree?

This is perhaps because the contraction is not much used with *might*.

A further factor, it seems to me (one that you mention but dismiss in a slightly different context) is the distance between *not* and the auxiliary, as measured by the length of the subject. The shorter it is, the easier I believe it is to put the *not* after the subject and still get a conducive interpretation. The pronoun *it* is probably the lightest subject we can get, and I find that *not* in this case *must* follow the subject regardless of the interpretation:

Was it not foolish to say that?

*Was not it foolish to say that?

... ,

2.1. CORRELATION WITH NEGATIVELY MARKED INDEFINITE PRONOUNS AND ADVERBS. Two of Bolinger's suggestions have been tested by eliciting the grammaticality judgments of students at three American universities in Indiana and Michigan.² The first suggestion relates to the acceptability of uncontracted *not* in pre-subject position in a sentence with *already* or *somebody*. A six-item test was used with three test items and three distractors. The test items follow:

In each numbered item two words are listed in the margin. Fill one blank with one of the two words, and the other blank with the other word.

Example: I didn't do it. done
 I haven't done them yet. do

- (2) A. I am afraid I can't leave now.
B₁. Why? Is your brother not here _____? already
B₂. Why? Is not your brother here _____? yet
- (4) A. Unfortunately there isn't anyone who can help us.
B₁. How come? Is not your neighbor home _____? yet
B₂. How come? Is your neighbor not home _____? already

- (6) With a 10-minute interval between them, Karin asked two questions:
 Would _____ not like to come? somebody
 Would not _____ like to come? anybody

The distractors appeared as items (1), (3) and (5) and called for a forced choice between *dreamed* and *dreamt*, *needn't* and *don't need to*, and *any* and *some*.

The instructions for the test were slightly changed for the Michigan subjects by adding 'so that both sentences sound as good as possible to you'. For this reason the results of the Indiana students and the Michigan students will be listed separately (Table 1):

Indiana: N = 42; Michigan: N = 90

ITEM #		<i>not+S ... already?</i>	<i>not+S ... yet?</i>	NON-COMPLIANCE ³
(2)	Indiana	39 (93%)	2 (5%)	1 (2%)
	Michigan	74 (82%)	13 (14%)	3 (3%)
	Total	113 (86%)	15 (11%)	4 (3%)
(4)	Indiana	30 (71%)	9 (21%)	3 (7%)
	Michigan	61 (68%)	26 (29%)	3 (3%)
	Total	91 (69%)	35 (27%)	6 (5%)
		<i>not+S(somebody)...?</i>	<i>not+S(anybody)...?</i>	
(6)	Indiana	22 (52%)	19 (45%)	1 (2%)
	Michigan	48 (53%)	40 (44%)	2 (2%)
	Total	70 (53%)	59 (45%)	3 (2%)

TABLE 1. Forced choice elicitation of *not+S* questions with indefinite pronouns and adverbs. N = 132.

Bolinger's intuitions proved to be fairly accurate for the subjects investigated. In the forced choice task used, 86% of the subjects did what Bolinger predicted on item (2), and 69% acted likewise on item (4). In other words, the overwhelming majority of subjects demonstrated that conducive word order patterns with *already* as in *Is not your brother here already?*, and non-conductive word order patterns with *yet* as in *Is your brother not here yet?*. The other side of the coin shows that, on item (2), 11% of the subjects made a forced choice which resulted in a sentence that Bolinger asterisked (*Why? Is not your brother here yet?*), while the number of subjects doing the same on the practically identical item (4) rose to 27 per cent. In other words, in a forced choice task, the minority of subjects (11 to 27%) did not show evidence of the copatterning of conducive word order with *already* in *not+S* questions.

However, Bolinger's claim that a similar effect would be seen with *any* and *some* cannot be proven by the data in this study. While 53% of the subjects chose *somebody* as the subject of a question with conducive (*not*+S) word order (*Would not somebody like to come?*), a large number of subjects (45%) chose *somebody* as the subject of a question with non-conducive (S+*not*) word order (*Would somebody not like to come?*; see item (6)).

2.2. THE LENGTH OF THE SUBJECT. Quirk *et al.* (1985:809) state that the *not*+S construction 'is especially likely in formal contexts where the subject is lengthy:

Does *not* everything we see about us testify to the power of Divine Providence?

Bolinger made the same suggestion and he agreed with Celce-Murcia & Larsen-Freeman (1983:113) that the pronoun *it*, being the lightest possible subject, cannot be used in a *not*+S question. Whereas Quirk *et al.* (1985) seem to endorse what Stockwell (1977) called the heavier element principle, they make no claim about the ungrammaticality of sentence (6):

(6) *Was not it foolish to say that?

In order to test the role of the length of the subject, the following test was used with the same students (now N = 130):

Put the word *not* into the following sentences and write them down.⁴

Example: You will see *Red is blue*. and you should write *Red is not blue*. Do not use contracted forms such as in *Red ISN'T blue*.

- (8) Is Steve here?
- (10) Was John Andrew Ririe's young stepson in school today?
- (12) Is James Earl Carter from around that region?
- (14) Has plagiarism been hotly debated recently?
- (16) Is it near the corner of Kirkwood and Indiana?

Five odd-numbered sentences (7 to 15) were used to hopefully distract subjects' attention from the research question. Table 2 shows the results arranged from the lightest to the heaviest subject NP.

Indiana: N = 42; Michigan N = 88⁵

SENTENCE #		<i>not</i> +S	S+ <i>not</i>	NON-COMPLIANCE
16	Indiana	4 (10%)	35 (83%)	3 (7%)
	Michigan	15 (17%)	70 (80%)	3 (3%)
	Total	19 (15%)	105 (80%)	6 (5%)
8		5 (12%)	33 (79%)	4 (10%)
		14 (16%)	73 (83%)	1 (1%)
		19 (15%)	106 (82%)	5 (4%)
14		9 (21%)	29 (69%)	4 (10%)
		32 (36%)	55 (63%)	1 (1%)
		41 (32%)	84 (65%)	5 (4%)
12		8 (20%)	29 (71%)	4 (10%)
		20 (22%)	66 (74%)	3 (3%)
		28 (22%)	95 (73%)	7 (5%)
10		6 (15%)	31 (76%)	4 (10%)
		17 (19%)	70 (79%)	2 (2%)
		23 (18%)	101 (78%)	6 (5%)

TABLE 2. *Not*-placement with subject NPs of variable length. N = 130.

The length of the subject NPs varies from one syllable in item (16) to eight syllables in item (10). According to the hypothesis that the shorter the S, the easier it is to put *not* after it (or: the longer the S, the easier it is to put *not* before it), it would be expected that the highest number of respondents use S+*not* on item (16) and the lowest number use it on item (10). Conversely, few respondents are expected to use *not*+S on item (16) and increasingly more are expected to use it on items (8, 14, 12 and 10). The results presented in Table 2 do not bear out the truth of this hypothesis: the incidence of S+*not* does not decrease as the length of the subject NP increases, and the number of respondents writing conducive *not*+S questions does not increase as the length of the subject NP increases. Noticeably different scores have been obtained on item (14), which has a medium-length subject NP.

One may assume that the fact that a purely formal hypothesis (the longer the form of constituent X, the more a particular word order is likely to occur) cannot be supported by elicitation data may be related to other, functional phenomena at work. Whereas the various elicitation techniques (see, e.g. Ilson 1991) are important means of obtaining linguistic data, the data thus gained is only ancillary to authentic language use, spoken or written. But discourse phenomena are particularly difficult to explain by appeal to intuition (see Coulthard & Brazil 1992: 50-51) and research in spoken discourse, as Coulthard

& Brazil claim, will, for a long time be data-based, i.e. not intuition-based, out of necessity. It is to the use of *not*+S questions in English speech that I turn now.

3. *Not*+S QUESTIONS IN SPEECH. Celce-Murcia & Larsen-Freeman (1983:113) claim that *not*+S questions like (3) are a very formal and archaic historical vestige, something reminiscent of Elizabethan literature or the King James version of the Bible, but they admit that such forms 'may still occur occasionally in formal English writing—particularly so, perhaps, if the author has had heavy exposure to English literature or English versions of the Bible that were produced two or more centuries ago.' This statement by the authors relegates *not*+S questions to the medium of writing alone, and to the fringes of normal language use.

Indeed, Celce-Murcia & Larsen-Freeman's intuitions are supported by some of the spontaneous comments recorded during the completion of the above elicitation tests. For instance, one student said 'No one would say "Is not your brother here?"' and another claimed he would use contracted forms or word the sentences differently.

Thus it should come as a surprise that such questions do indeed occur in English speech. I first heard them in a TV broadcast of British Parliament shown on C-SPAN in the Fall of 1992. As usual, the opposition leader Mr. John Smith was taking to task the Prime Minister in the Prime Minister's questions session. This kind of discourse can be characterized as adversative rather than cooperative (see Fraser 1987). The following newspaper report illustrates the general tone of such discourse:

Mr. Smith, capitalising on Labour's successful amendment to the Maastricht legislation, forcing the Government to select 24 UK members on the EC's new advisory Committee of the Regions from elected councillors, said: "Is not the painful truth for the Prime Minister this: that far from being stabbed in the back... he shot himself in the foot?"

Major turns charm on Maastricht rebels. *The Independent* 10 March 1993, p. 1.

After hearing a number of such questions spoken in heated debates, but being unable to obtain a large enough corpus of video recordings of British Parliament in the US, I purchased a copy of the House of Commons Official Report (Hansard for short) for 10 March 1993 and gleaned *not*+S examples from it. A number of them seem to fit the discourse category called ELICIT:AGREE by Tsui (1992). She defines 'elicitations' as a discourse category which describes any utterance which functions to elicit an *obligatory* (emphasis in the original) verbal response or its non-verbal surrogate. Elicitations are classified according to the different responses prospected. Elicit:agree, the third of six subcategories in

Tsui's system, 'invite[s] the addressee to agree with the speaker's assumption that the expressed proposition is self-evidently true. ... It is most commonly realized by tag interrogatives and negative polar interrogatives, both spoken with a falling tone.' (1992:107)

Examples of the expressed proposition taken to be self-evidently true include (7-10):

(7) In the debate of the draft Public Lending Right Mr. Brandreth makes the point that the British often mock the successful people who bring millions of pounds to their country. Successful authors whose books have been loaned over 1 million times are also mocked. To this Sir Roger Moate responds:

Far from attacking successful authors, we are rewarding them with £6,000 each. Is not this munificence?

(Hansard, 907)

(8) In an Oral Answers to Questions session the Secretary of State for Foreign and Commonwealth Affairs is asked to make a statement on a particular problem in the Yugoslav crisis. After several exchanges between the Secretary of State and MPs, Mr. Wareing says the following:

Was not the ceasefire in Krajina breached on 22 January by the aggressive action of the Croats? If a ceasefire is to hold and a more permanent peace be brought about, is not one of the vital needs in the area that the Serb minority should feel that they are protected?

(Hansard, 928)

(9) In a discussion of European Community issues Sir Teddy Taylor asks the Secretary of State if he will publish a list of the areas of policy which remain within the exclusive competence of national parliaments in the EC. The Secretary of State hedges and concludes his answer by saying that it is not possible to draw up an exhaustive list. Sir Teddy Taylor explodes:

(9a) Is not it an outrage that the Minister has not even tried to answer the question? ... Does not the Minister think that he has a duty to tell people the facts before they vote?

The Secretary of State responds and then Mr. Skinner attacks:

(9b) Does not the Minister understand that while he and Ministers like him on the Front Bench, as well as other members of the

chattering classes and other politicians, talk about the glories of Maastricht and the Common Market in particular, 70 per cent of the masses outside do not want the Maastricht treaty, because ...?

Another response from the Secretary of State is now followed by Mr. Churchill's question:

(9c) Given the strong attachment of the EFTA nations to their national sovereignty, is not it clear that once the enlargement of the Community becomes a reality, the dreams of those who would create federal palaces in the air will slam against the buffers of reality?

(Hansard, 930)

(10) In a discussion of human rights abuses and terrorism in India, Mr. Jessel asks the following question:

As the most important human right is the right to stay alive, and as India has an entirely exceptional problem with terrorism, which causes death, and as the Indian Government are quick to investigate and punish acts of violence, should not India have the complete understanding and sympathy of the House?

(Hansard, 936-937)

3.1. WHO IS THE ADDRESSEE? According to Tsui (see quote above) the Elicit:agree invites the *addressee* (my emphasis) to agree with the speaker's assumption that the expressed proposition is self-evidently true. But just who the addressee is is not always easy to define. It is especially difficult in a setting like televised parliamentary debates, where a speaker may address a particular person such as the Prime Minister; or may ask a rhetorical question in which case s/he may try to seek the agreement of (most) MPs, which makes (most) MPs the speaker's addressees; and the whole situation is complicated by the act of television coverage, which brings in an even larger circle of audience or addressees. For instance, in the Public Lending Right debate when Mrs. Clwyd says

(11) Does not the Minister agree that these sentiments, laudible [sic] though they may be, are fanciful and will remain so while the Government fail to provide libraries and local authorities with proper funding?

(Hansard, 901)

the potential addressees include (a) the Minister alone, (b) most MPs in the room but not the Minister, and (c) both (a) and (b) together. On the basis of a printed

transcript, without knowing where Mrs. Clwyd was looking during the question and without knowing her intonation, it is impossible to decide who the actual addressee was.

In other cases, however, even an impoverished transcript like the Hansard may make it possible to unequivocally identify the addressee. For instance, before Mrs. Clwyd said (11) above, she had been called to order several times by Madam Deputy Speaker. Right after (11) she cut in:

(12) Madam Deputy Speaker: Order. Does not the hon. Lady understand the purport of what I have said to her? This is out of order, and I cannot allow it to continue.

(Hansard, 901)

3.2. THE POSITION OF THE PRONOUN *it*. Recall that both Bolinger and Celce-Murcia & Larsen-Freeman claimed that *it* cannot occur in *not*+S questions. Examples (9a) and (9c) above prove this claim wrong. Of course, there are people who seem to use the constructions as the three linguists claim they are used, for instance, Mr. David Winnick in a prevention of terrorism debate:

(13) Is not the Home Secretary playing on dangerous grounds? The House of Commons is usually divided on virtually every subject under the sun. However, one form of unity that we have is our opposition to and loathing of all forms of terrorism, not least from Northern Ireland. Therefore, would it not be unfortunate and dangerous for the Home Secretary to give any impression other than ... ?

(Hansard, 956)

The point, however, is that even sentences like (6), asterisked by such a perceptive linguist as Bolinger, occur in at least one conversational setting: the British Parliament. Rare though they may be in speech, they are now attested. The viability of such constructions is also supported by 15% of the students in the elicitation experiment (cf. Table 2).

4. IN LIEU OF CONCLUSION. Questions like the one in the title of this paper were deemed ungrammatical in English grammars until 1980. Their use was then illustrated by printed examples from different versions of the Bible and from contemporary academic essays as well as several elicitation experiments. The claim was made that *not*+S questions are uncontracted conducive questions (Kontra 1981). Further elicitation experiments have shown that the indefinite pronoun *somebody* and the adverb *already* tend to pattern with the conducive *not*+S word order. Such questions occur in speech as well, at least in one setting: the adversative discourse of televised debates in the British Parliament. On the

basis of examples gleaned from the Hansard it is claimed that *not*+S questions are used to invite the addressee to agree with the speaker's assumption that the expressed proposition is self-evidently true. If this analysis is correct, then the title of this paper, delivered orally at the Twentieth LACUS Forum in Chicago, is well-formed and appropriately used. The proposition that native speakers of English use *not*+S questions in speech is self-evident to this author because he has heard such questions on television. However, some members of the LACUS audience (and some readers of the printed version) may question the appropriacy of this title because they may not have heard such spoken discourses as are found in the British Parliament. Nevertheless a spoken question like *Is not it an outrage that the Minister has not even tried to answer the question?* is part and parcel of English. Further research utilizing computerized corpora and prosodic analysis may shed more light on just when and why such questions are spoken.

NOTES

1. This research was conducted during my Fulbright research grant (#16540) at Indiana University in 1992-93, for which thanks are due to the Fulbright Foreign Scholarship Board and the Council for International Exchange of Scholars. I also owe a debt of gratitude to Tamás Váradi (University of London) for examining the LOB corpus for *not*+S questions and reporting to me their presence therein. Kathleen Bardovi-Harlig (Indiana University) has kindly offered useful criticism of an earlier version.
2. The experiments were conducted with 15 freshmen and sophomores in the College of Arts and Sciences, Indiana University, Bloomington; 27 students majoring or minoring in speech pathology or education at Indiana State University, Terre Haute (average age c. 21 years); and 90 students taking a 'general education' course at Michigan State University, East Lansing (average age c. 20 years). All subjects were native speakers of American English. The tests were administered in March and April of 1993. I owe special thanks to Deborah Hardison, Leslie Barratt and Dennis Preston for their help.
3. Cases of non-compliance involved the use of contracted forms, the use of the same word for both sentences, or missing answers.
4. The instructions for the Michigan students were again somewhat different: 'Please put an "X" in the following sentences to show where you would place the word "not" so as to make the sentence as natural as possible. Example: Red is X blue.' For this reason the results are listed separately again.
5. On items 12 and 10 the Indiana respondents' number decreases to 41 while the Michigan respondents increase to 89.

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WENT AND GOT [:] SOME DATA

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This study had its origin when a member of the University of Cincinnati English Department, a specialist in freshman composition, who happens to be a middle-aged, female, European-American, middle class speaker of the Inland Northern variety of American English, uttered sentence (1):

(1) *Well, I see my garbage went and got collected.*

Most speakers of modern English are familiar with the *get* passive, and as we shall see, the construction is by no means an innovation. As a speaker of the South Midland dialect of American English, I have been known to use *went and* sentences and even to combine them with the *get* passive as in sentence (1). However, even in context sentence 1 sounded odd to me at the time of its utterance. Long acquaintance with the speaker and a close retrospective analysis of the discourse context convinced me that sentence (1) was not a result of her accommodating to my dialect.

Social and regional variation in use of the *get* passive turned up a few days later when I produced the utterance listed as (2) in the course of a conversation with my ten-year-old daughter:

(2) *Now that Dart [her horse] is on that new pasture, you better watch him: we wouldn't want him to get floundered.*

At this point, my wife and several other horse fanciers intervened to correct my lexical choice, informing me that the proper verb was *to founder*, not *to flounder*. I replied that, as a former farmer who had spent most of his twelfth summer walking behind a working horse and as a sometime worker of cattle, I did not care much about their urban sensibilities. As usual in cases of social or regional dialect clash, my interlocutors had objected to my lexical choice, but I was more concerned with my choice of the *get* passive in (2). Why did I choose *get floundered* over *founder*? Was *get floundered* really a passive at all? Did the choice of the *get* construction over another construction have semantic or pragmatic consequences?

At that point, I had a vague notion that use of *get* passives had something to do with responsibility for the events related in an utterance, which might explain why sentence (1) had sounded rather odd, but a series of Chomskyan thought experiments did little to clarify matters. Did the use of the *get* passive imply more or less responsibility for events? And who was responsible, anyway? The agent? The subject of the sentence? The patient?

As it turns out, literature on the English passive in general and the *get* passive in particular reveals that my uncertainty about the semantic and pragmatic meaning of the passive is not unique.

A first difficulty stems from the lack of solid data. The probability that any given syntactic structure will occur in everyday language use is relatively small. As I discovered in research for two previous LACUS Forum presentations (Mills 1991, 1992), passive constructions are extremely rare, at least in written English narrative. Full (or agented) passives like sentence (3) are even more scarce:

(3) *The police arrested John.*

This mirrors the findings of Weiner and Labov (1983):

in spontaneous speech, the proportions of passives with two-argument predicates is vanishingly small in all data examined so far The vast majority of passive constructions has only one argument, that is, no agent is present (32).

Langacker and Munro (1975) reported essentially the same rarity.

As I discovered in researching Mills 1991, 1992, short (or agentless) passives are relatively rare, and full passives are virtually nonexistent. In my data, *get* passives seem to fall between full and short passives in their frequency of occurrence.

The preference for short passives and *get* passives, in that order, and the disfavoring of full passives might be interpreted by transformational grammarians as evidence in favor of the sort of analysis put forth by Emonds (1976). Alternatively, one could argue that these preferences offer evidence in favor of Chafe's (1970) views on the centrality of the patient-verb relationship in the sentence. Actually, I would argue that the relative frequencies of the various constructions show that speakers prefer the shortest sentence needed to communicate a given meaning, all other things being equal.

As it turns out, the *get* passive is not a new construction. Both Fries (1940) and Feagin (1979) cite evidence in the *OED* for the *get* passive as early as the mid-seventeenth century. In addition, all

grammarians seem to agree that the *get* passive is in increasing use. Svartvik (1966), in his thorough study of English verb voice, cites numerous traditional grammarians from Jespersen through W. Nelson Francis on the increasing use of *get* passive.

Francis (1958) has this to say:

passive voice forms consist of some form of the auxiliary *be* with the past-participle form of the verb. Another passive, formed with *get* as auxiliary and the past-participle, seems to be increasing in frequency, though grammarians are at present not agreed as to its status (335).

Svartvik (1966) quotes Fries (1940) as saying that "*get* occurs more frequently in vulgar English" (92). Actually, the way in which Svartvik quotes Fries may be slightly misleading. Fries actually wrote this:

this particular combination of *get* and the past participle appears in both the Standard English materials and those of Vulgar English. . . however, it occurs more frequently in Vulgar English (193).

Fries's use of capitalization here may mean that by "Vulgar English" he meant 'informal or casual register' rather than what is implied in Svartvik (1966).

Later grammarians' treatments of the *get* passive do not go much beyond the sources cited in Svartvik (1966). Hasegawa (1968) offers an analysis of the English passive within the then prevalent *Aspects* model where he notes the existence of the *get* passive as an unexplained variant of the *be* passive: "It seems clear that *get* + *En* behaves pretty much in the same manner as *be* + *En*, and that *get* + *En* must be extracted as another passive formative" (232). For the most part, generative grammarians seem to regard variation among actives, full passives, short passives, and *get* passives as free variation which does not need to be explained on either semantic or sociolinguistic grounds. Researchers with an interest in language as a human phenomenon are apt to find such analyses as seriously incomplete or (at worst) beside the point. Feagin (1979) tends to treat both *be* and *get* passives as simple variants of active constructions, though she does present fascinating data that indicate that the *get* passive is spreading rapidly in the south across age and social class boundaries.

At the same time, however, Feagin argues that the *get* passive has a different function than ordinary passives: "*Get* passive appears to

contribute a stronger, more lively, more intimate or more earthy meaning to the sentence" (96).

In 1971, R. Lakoff went even further. First, she pointed out that the so-called standard theory could not "relate the two passives of English (*be* and *get*) to each other in a fully satisfying way" (149). Second, Lakoff points out that "other languages have 'middle' constructions, which fulfill the roles of both *get*-passives and reflexives of certain types" (149). Third, Lakoff argues that the "semantic equivalence" among actives, full passives, short passives, and *get* passives, which generative grammarians were especially fond of assuming, is highly questionable. Finally, Lakoff, like Feagin, argues for functional differences among the various passives:

the *get* passive in English, unlike the *be* passive, is frequently used to reflect the attitude of the speaker toward the events described in the sentence: whether he [sic] feels they are good or bad, or reflect well or poorly on him or the superficial subject of the sentence (for whom he thus expresses implicit sympathy) (154).

Though one may quarrel with Lakoff as to what the *get* passive means, it is clear that she, like Feagin, interprets it as semantically or pragmatically different from other passives.

Although Lakoff argues that sentences like (4) and (5) show clear semantic differences,

(4) *John got arrested to test the law.*

(5) *John was arrested to test the law.*

Weiner and Labov (1983) claim that their data show that sentences like (4) and (5) "are interpreted as semantically equivalent" (39) if the purpose clauses are absent. Weiner and Labov maintain that as long as we stick to truth-conditional semantics, semantic equivalence is far less problematic than R. Lakoff claims.

Interestingly, Weiner and Labov claim that there are no real sociolinguistic differences between short passives and *get* passives--except for the effect of age. Weiner and Labov found that adults in their samples tend to use *be* as the passive auxiliary. Female teenagers also seem to prefer *be* but less than adults. White male teenagers use more *get* passives. And African American male teenagers use *get* passives more than any other group. They then cite Feagin (1979), who found that adults in Anniston, Alabama, used fewer than 30% *get* passives, while adolescents, both boys and girls, used more than 80% *get* passives.

Feagin argued that the spread of *get* passive was a case of

change from below (the level of conscious awareness) and that it "is the only case in this study where a form can be observed spreading from the working to the upper class" (96).

Commenting on their data and Feagin's, Weiner and Labov wrote that

a shift to the *get* passive appears to be one of the most active grammatical changes taking place in English; and at least in the north, it seems to be also a stigmatized sociolinguistic variant which is used more by males than females (43).

With so much agreement on the spread of the *get* passive and so much confusion as to its semantics and pragmatics, we might expect to find the situation even less clear for *went and got* sentences. Actually, I have not yet found any literature covering this construction. My own linguistic intuitions, for what they are worth, seem to imply a connection between other (semi)serialized English *go and* constructions, as illustrated in (6-9):

- (6) *Go get me some cigarettes.*
- (7) *Go and bring me a hammer.*
- (8) *We went and saw a movie last night.*
- (9) *I went and bought a new car.*

Clearly, combining *go and* constructions with *get* passives complicates interpretation, but one might argue that a residual connection with the notion of 'deliberate act', contained within the meaning of *go*, would lead to the sense that *went and got* sentences imply some sense of responsibility on the part of some entity. When we consider R. Lakoff's claim that *get* passives are equivalent to reflexives in some languages, semantics and pragmatics become still more complicated. For as Weiner and Labov point out, it is possible to extend (4) to:

- (10) *John got himself arrested to test the law.*

And *went and got* sentences can also be reflexive:

- (11) *John went and got himself arrested to test the law.*

Given the relative scarcity of any particular construction in everyday speech, it is necessary to use constructed examples to obtain empirical data on the interpretation and sociolinguistic evaluation of

constructions. There are many drawbacks to the use of constructed examples, but in many instances their use is the only practical way to obtain native speaker reactions.

In order to obtain native speaker reactions to sentences like the ones given so far, sentences (12-23) were presented to volunteer subjects. The sentences were intermixed with irrelevant distractor sentences. Distractors were chosen from a local newspaper; they included actives, full passives, and short passives, though there were no *get* passives and, of course, no *went and got* sentences among the distractors. The full set of test and distractor sentences were randomized and presented to subjects in a written questionnaire. Subjects were volunteers from three different sections of English 340: Introduction to the Study of Language, an introductory linguistics course for English and Education majors. Previous studies have shown that the evaluations of subjects from this population mirror fairly well the linguistic norms of both urban and rural midwestern American communities. All subjects were native speakers of English.

Subjects were asked to perform two sentence rating tasks as outlined in the appendix.

Results of the rating tasks for the test sentences are given in Table 1 in the appendix. Graphic representations of the variation in Responsibility and Acceptability ratings are given in Figure 1 for sentences with animate patients ("arrested" sentences) and in Figure 2 for sentences with inanimate patients ("vandalized" sentences).

A Friedman nonparametric two-way ANOVA for repeat measures shows, as might be expected, significant ($\chi^2=37.4885$, $p=.0001$) differences for Responsibility ratings among the test sentences and significant ($\chi^2=53.9692$, $p=.0000$) differences for Acceptability. Rank order of sentence Responsibility ratings are given in Table 2, with Acceptability ratings in Table 3.

When we examine Responsibility ratings for sentences with animate patients ("arrested" sentences), we find that the three highest ranked sentences--active, *went and got*, and *went and got* reflexive sentences--do not differ significantly from each other. Sign tests reveal that both *went and got* and *went and got* reflexive sentences are ranked significantly higher on Responsibility than *get* passives, short passives, and full passives. The active voice sentence is significantly higher on the Responsibility rating than the short passive, but not the full passive. Other differences were not significant.

When we look at the Acceptability ratings for these sentences, we find that *went and got* and *went and got* reflexive sentences rank significantly lower than all the other sentences. Interestingly, the *get* passive sentence patterns with the active voice, full passive, and short passive sentences, and is significantly higher in Acceptability than either

went and got construction.

These results would seem to indicate that *went and got* constructions are seen as implying responsibility of some entity, probably the subject of the sentence regardless of agent, for events described by the sentence. At the same time, the *get* passive is not seen as socially stigmatized, but *went and got* constructions are.

When we look at sentences with inanimate patients (the "vandalized" sentences), we find much more variability in informants' evaluations of both Responsibility and Acceptability.

Rank order of Responsibility ratings for "vandalized" sentences are given in Table 4, with Acceptability ratings for these sentences rank ordered in Table 5.

For the "vandalized" sentences, the active voice sentence rates significantly higher on Responsibility than full passives, short passives, and *get* passives. On the other hand, the active voice sentence does not rate significantly higher on Responsibility than either of the *went and got* constructions.

On Acceptability ratings for these sentences, the active, full passive, and short passive sentences pattern together, the *went and got* constructions pattern together, and the *get* passive falls in between. The *get* passive is significantly more acceptable than the *went and got* constructions, and it is significantly less acceptable than the active, full passive, and short passive sentences.

At the very least, these results explain my intuition that sentence (1) was odd. With an inanimate patient serving as grammatical subject of the sentence, such a sentence would be interpreted as high on Responsibility but very low on Acceptability.

Furthermore, these data seem to bear out Feagin's contention that the *get* passive is becoming increasingly prevalent and increasingly acceptable, though the acceptability of the *get* passive falls off if the patient (or the subject of the sentence) is inanimate.

When one considers possible sentences for native speakers to evaluate, possible variants seem to multiply exponentially, and subject fatigue soon sets in. For future research, however, I plan to add sentences using the generalized indefinite subject (Weiner & Labov 1983):

(24) *They arrested John.*

(25) *They vandalized my car.*

In the meantime, comments, interpretations, and suggestions for further research would be welcome.

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APPENDIX

Questionnaire

This is an experiment to see how people use and understand English sentences. In the questionnaire that follows, you will be presented with a number of sentences. The questions will describe actions committed by a number of agents, some of them unspecified.

Your main task is to decide how responsible the agent in each sentence was for the act described by each sentence. We are all familiar with sentences like these:

He didn't have to do that.

She did it on purpose.

They were responsible.

We are also familiar with sentences of this sort:

He did it, but it wasn't really his fault.

She couldn't have prevented it from happening.

It was an accident.

Though we all know that matters of responsibility, credit, and blame are seldom clearcut, we have all overheard sentences like those above.

Please read the sentences below carefully and then assign the agent of the sentence (the person or thing that carried out the action denoted by the verb of the sentence) a RESPONSIBILITY RATING for the event described in each sentence. In rating responsibility for each event, use a scale of 1 to 4, with the following values:

- 1 not responsible at all: the agent bears no responsibility for what happened; she or he gets no credit or blame
- 2 neutral: it is impossible to say whether the agent was responsible for what happened
- 3 somewhat responsible: perhaps the agent could be considered responsible, but there are many reasons why the agent cannot be given much blame or much credit for what happened
- 4 high responsibility: while there might be some reason to think the agent is responsible, the agent bears a great deal of responsibility for the event described by the sentence

As a help to us in designing future experiments, please rate each sentence for NATURALNESS, ACCEPTABILITY, or how "ENGLISH" it sounds to you, using the following scale:

- 1 difficult to understand and of doubtful acceptability in many contexts
- 2 I can't say how natural or acceptable this sentence might be
- 3 not very natural, but acceptable in a great many contexts
- 4 natural and acceptable in just about any context

Please use your own definition of "acceptable" or "natural." We are simply interested in making our experimental sentences as unremarkable as possible.

Sentence:	Mean Responsib:	s.d.:	Mean Accept:	s.d.:
<i>The police arrested John.</i>	3.24	.89	3.95	.22
<i>John was arrested by the police.</i>	2.62	.80	3.76	.70
<i>John was arrested.</i>	2.76	.70	3.90	.30
<i>John got arrested.</i>	2.76	.83	3.62	.80
<i>John went and got arrested.</i>	3.33	1.06	2.57	.93
<i>John went and got himself arrested.</i>	3.70	.95	3.00	.94
<i>Someone vandalized my car.</i>	3.43	1.12	4.00	.00
<i>My car was vandalized by someone.</i>	2.19	1.21	3.95	.22
<i>My car was vandalized.</i>	1.48	.75	3.95	.22
<i>My car got vandalized.</i>	1.57	.98	3.48	.60
<i>My car went and got vandalized.</i>	2.05	1.20	1.86	.96
<i>My car went and got itself vandalized.</i>	2.10	1.37	1.60	.84

Table 1. Mean Sentence Ratings

<i>John went and got himself arrested.</i>	[Highest Rank]
<i>John went and got arrested.</i>	
<i>The police arrested John.</i>	
<i>John got arrested.</i>	
<i>John was arrested.</i>	
<i>John was arrested by the police.</i>	[Lowest Rank]

Table 2. Rank Order of Responsibility of "Arrested" Sentences

<i>The police arrested John.</i>	[Highest Rank]
<i>John was arrested.</i>	
[Tie] <i>John was arrested by the police.</i>	
[Tie] <i>John got arrested.</i>	
<i>John went and got himself arrested.</i>	
<i>John went and got arrested.</i>	[Lowest Rank]

Table 3. Rank Order of Acceptability of "Arrested" Sentences

<i>Someone vandalized my car.</i>	[Highest Rank]
<i>My car went and got vandalized.</i>	
<i>My car went and got itself vandalized</i>	
<i>My car was vandalized by someone.</i>	
<i>My car got vandalized.</i>	
<i>My car was vandalized.</i>	[Lowest Rank]

Table 4. Rank Order of Responsibility of "Vandalized" Sentences

[Tie] <i>Someone vandalized my car.</i>	[Highest Rank]
[Tie] <i>My car was vandalized by someone.</i>	
<i>My car was vandalized.</i>	
<i>My car got vandalized.</i>	
<i>My car went and got vandalized.</i>	
<i>My car went and got itself vandalized.</i>	[Lowest Rank]

Table 5. Rank Order of Acceptability of "Vandalized" Sentences

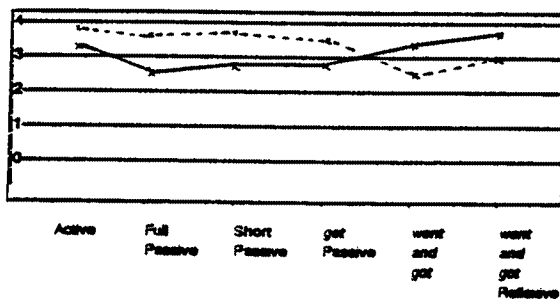


Figure 1. Mean Values of Responsibility (—) and Acceptability (---): Arrested

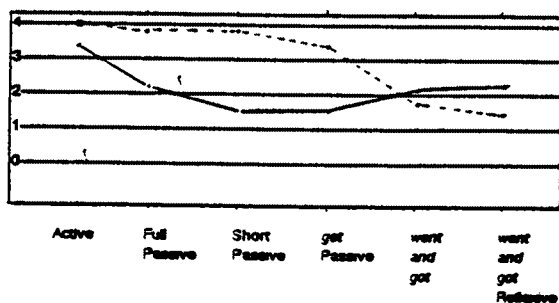


Figure 2. Mean Values of Responsibility (—) and Acceptability (---): Vandalized

SENTENTIAL TIME ADVERBIALS VS. VP TIME EXPRESSIONS: DIFFERENT TIMES *

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0. Introduction

Dowty (1979) treats time expressions in natural languages as syntactically of two major categories: sentential time adverbials of category (t/t) like *today* in (1a) and verb-phrase (VP) time adverbials of category (IV/IV) like *for two hours* in (1b).

- (1) a. *Today*, Bill read a book.
- b. Bill ran *for two hours*.

I argue that these two categories of time expressions exhibit more than syntactic differences, and in fact, they represent two different dimensions of temporal relations in natural languages: Frame Time (FT) and Situation Time (ST). Sentential time adverbials like *today* in (1a) represent FT, a set of instants or intervals of time denoted by referring time expressions. FT sets up a temporal frame in which an event/activity takes place or a state holds. Together with VP, VP time expressions like *for two hours* in (1b) represent ST, a set of instants or intervals of time referred to by verbs or VP time expressions.

The treatment of time expressions as FT and ST representing different dimensions of temporal relations has implications for studies on temporal relations in natural languages, where some previous approaches in linguistics and philosophy (cf. Bennett & Partee 1978, Bennett 1981, Dowty 1979, Montague 1973) are inadequate to present a complete picture.

This paper is divided into four sections. In the first section, I will briefly discuss some previous approaches to time expressions. In the second, I will define FT and discuss its logic properties with related linguistic evidence from Chinese and English. In the third section, I will define ST with a discussion on its logic properties and relevant linguistic evidence. In the last section, I will briefly discuss the implications that my approach to temporal relations has for

research on temporal relations in natural languages.

1. A Brief Review of Previous Approaches

Dowty (1979:332-6) treats temporal expressions as two categories: sentential and VP. Temporal expressions like *today*, *Monday*, *next week*, *last month* and *this year* belong to the former category, while those like *for an hour* and *in an hour* fall into the latter category. Meanwhile, Dowty (1979) has observed that a *for*-expression may become a sentential time adverbial, when it has a wide scope interpretation, as in (2).¹

- (2) The sheriff jailed Robin Hood *for four years*.
 - a. FOR FOUR YEARS, the sheriff jailed Robin Hood.
 - b. The sheriff jailed Robin Hood FOR FOUR YEARS.

When the *for*-expression has a wide scope, (2) has an iterative reading as in (2a), which means that the sheriff jailed Robin Hood repeatedly in a period of four years. Otherwise, (2) has a durative reading, as in (2b), which says that Robin Hood was jailed for four years. In addition, Dowty notes that *in*-expressions and *for*-expressions appear to be involved in aspect interpretations, as in (3).

- (3) a. John read a book in an hour.
- b. John read a book for an hour.

(3a) has a perfective reading, while (3b) has an imperfective reading. Thus, Dowty's own observation suggests that his syntactic classes are not adequate. Binnick (1991:303-4) argues that Dowty's categories are unnecessary and that *for*-expressions and most time adverbials function either as sentential adverbials or as VP adverbials. Sentential or VP time adverbials are a co-occurrence or scope phenomenon.

On the other hand, Parsons (1990:207-28) classifies temporal adverbials into three categories: frame, predicate of event and predicate of interval, as shown in (4).

- (4) a. Mary ran *from 2:00 to 3:00*. (Pred. of event)
- b. *From 2:00 to 3:00*, Mary ran. (Pred. of interval)
- c. *From May to August*, Mary ran every day. (Frame)

(4) indicates that Parsons treats sentential time adverbials as predicate of interval and frame but VP time adverbials as predicate of event,

though it is not clear how *every day* in (4c) is treated. (4a) says that the event of running lasts from 2 o'clock to 3 o'clock. (4b) means that within the interval between 2 o'clock and 3 o'clock the event of running takes place. (4c) says that every day from May to August the event of running takes place.

Among Parsons' three classes, frame adverbials are considered in other studies. Bennett and Partee (1978:22-30) label a group of adverbials like *this morning*, *today*, and *in 1973* as 'frame adverbial phrases', as compared to 'durative adverbial phrases' and 'adverbial phrases of number and frequency'. According to Bennett and Partee (1978:22), 'Frame adverbial phrases refer to an interval of time within which the described event is asserted to have taken place'. However, they do not give their classification of temporal adverbials any theoretical significance in their study of tense and aspect. Smith (1991:155) has also mentioned frame adverbials in her treatment of temporal adverbials. She refers to frame adverbials as 'locating adverbials', which contribute to the specification of her Reference Time and Situation Time. She does not elaborate on the significance of frame or locating adverbials theoretically either.

In short, temporal expressions are categorized syntactically as sentential and VP in Dowty 1979, semantically as with wide scope and narrow scope readings in Binnick 1991 or as frame, predicate of event and predicate of interval in Parsons 1990. Some time adverbials are referred to as frame adverbial without any theoretical considerations in Bennett and Partee 1978 and in Smith 1991.

2. Frame Time: the Dimension of Temporal Inclusion Relations

FT is related to what are called 'frame adverbials' in Bennett and Partee 1978, Parsons 1990 and Smith 1991. Apparently, the term of my FT has its origin in the above authors' classification of frame adverbials. However, my FT is different from the previous authors' frame adverbials in that it is viewed as a dimension of the representation of temporal relations in natural languages, instead of simply a subclass of adverbials. FT is formally defined as (5).

- (5) Frame Time (FT) is a set of intervals of time, which are denoted by temporal frame phrases and within which a described event/activity takes place or a state holds.

FT represents temporal inclusion relations: FT includes FT and FT includes ST.² In the measurement of the duration of time, a relation

exists among the units of measure (frames) that a smaller frame of time f is temporally included in a larger frame of time F . Temporal inclusion is formally defined in (6).

- (6) F includes f just in case f does not begin earlier than F and f does not end after F (symbolically as $f \in F$, where f symbolizes a smaller frame of FT, F a smaller frame and $\in$ stands for temporal inclusion).

Within Frame Time, a larger frame of FT is the upper-bound of FT, while the smaller frame of FT is considered the lower-bound of FT. The bounds are context-relative. For example, in a FT expression like *at 8 o'clock in the morning*, *at 8 o'clock* is considered to refer to the lower bound and *in the morning* to the upper bound. A frame of FT may temporally include another frame or be included in another frame, as defined in (6). What properties does the temporal inclusion in FT show in natural languages? One of the most important properties in FT as represented in the structure of time in natural languages is transitivity, as defined in (7), where I = being temporally included, f = frame, and F = Frame Time.

- (7) I is transitive iff $\forall f_1, f_2, f_3 \in F: I(f_1, f_2) \wedge I(f_2, f_3) \rightarrow I(f_1, f_3)$

(7) says that if f_1 is temporally included in f_2 , and f_2 is temporally included in f_3 , then f_1 is temporally included in f_3 . The transitive property of the inclusion relation in FT underpins the entailment relationship in the sentences in (8).

- (8) a. Mary walked to school *at 8 am yesterday morning*.
 b. Mary walked to school *yesterday morning*.
 c. Mary walked to school *yesterday*.

Certain implications exist among the sentences in (8). (8a) implies (8b) and (8c), and both (8a) and (8b) imply (8c). If (8a) is a true sentence, then (8b) and (8c) are true sentences and so on. These entailment relations exist, because *8 am* is temporally included in *yesterday morning*, and *yesterday morning* is temporally included in *yesterday*. I refer to this inferential pattern as 'upward' in the sense that a sentence with a smaller frame of FT implies one with a larger frame of FT. However, the reverse is not necessarily true. For

example, if (8b) is true, (8a) may not be a true sentence, since it is possible that Mary walked to school at any time yesterday morning other than at about 8 am. The unreversible entailment relations in FT are formally represented as (9).

- (9) $sf \rightarrow sF$; $sF \not\rightarrow sf$, iff $f \in F$, where sf = a sentence with a smaller frame of FT, sF = one with a larger frame of FT, $\rightarrow$ = implies, and $\not\rightarrow$ = not imply

(9) characterizes an important temporal relation in natural languages, as illustrated in (8).

Semantically, time expressions that meet the definition in (6) and represent temporal relations defined in (7) and (9) are FT adverbials. What is the syntactic difference between FT adverbials and ST expressions? In English, this seems to be rather confusing, as my review indicates. I believe that the actual syntactic positions may not matter much in English with regard to the classes, if a temporal adverbial is syntactically so positioned that a wide scope is available. I propose a frequency-adverbial test for the distinction between FT adverbials and ST expressions. Frequency adverbials are treated as sentential operators in representing temporal relations in semantics (Åqvist, Hoepelman and Rohrer 1980, Richards 1982). Semantically, a temporal adverbial that has a wider scope than a frequency adverbial is considered a FT adverbial. Syntactically, a temporal adverbial that is ordered outside the scope of a frequency adverbial is considered a FT adverbial. First, I show what temporal adverbials may appear within the scope of a frequency adverbial, as in (10).

- (10) a. ?John ran yesterday *twice*.
 b. ?John read a book in an hour *twice*.
 c. John ran for an hour *twice*.

(10) indicates that only the *for*-temporal adverbial that functions as 'a predicate of event' may naturally occur within the scope of a frequency adverbial, as in (10c), while other temporal adverbials may not occur naturally within the scope of a frequency adverbial, as in (10a) and (10b). Second, let me show what temporal adverbials may occur outside the scope of a frequency adverbial, as in (11).

- (11) a. John ran *twice* yesterday.
 b. John read a book *twice* in an hour.
 b. John ran *twice* for an hour.

The sentences in (11) suggest that *for-*, *in-* and other temporal adverbials may all occur as FT adverbials outside the scope of a frequency adverbial. Syntactic order of FT adverbials seems to be language-specific, but the temporal relation that FT adverbials represent in the form of scope phenomenon is more universal. For example, FT adverbials occur universally in pre-verb or sentence-initial positions in Chinese, as in (12)

- (12) a. Zhangsan *jintian* kan le yiben shu.
 Zhangsan today read Asp. one book
 Today, Zhangsan read a book.
 b. *Jintian* Zhangsan kan le yiben shu.
 Today Zhangsan read Asp. one book
 Today, Zhangsan read a book.
 c. *Zhangsan kan le yiben shu *jintian*.
 Zhangsan read Asp. one book today
 Zhangsan read a book today.

It is ungrammatical for a FT adverbial to occur in the sentence-final position in Chinese, as in (12c).

To sum up, I have argued for FT as a dimension of the representation of temporal relations in natural languages. My argument is supported by evidence that FT has logic behaviors different from other dimensions, such as ST in the next section. Time adverbials can be classified as FT or non-FT. FT adverbials in English semantically require wide scope interpretations, while FT in Chinese requires both syntactically wide scope positions and semantically wide scope interpretations.

3. Situation Time: the Dimension of Temporal Part-Whole Relations

Following Comrie 1976 and Smith 1991, I use 'situation' as a general term for 'event', 'activity', 'process' and 'state' denoted by verbs or verb phrases. In philosophical and logical studies (Gabbay & Moravcsik 1980:60), there are three ways to treat the assignment of denotations of verbs and nouns: i) verbs denote situations and nouns denote objects with a problem of how to link the two domains; ii) situations that are denoted by verbs are the basic domain and objects that are denoted by nouns function as modifications of situations; and iii) objects that are denoted by nouns are the basic domain and verbs denote properties of objects. I consider verbal denotations in the spirit of the second approach: situations denoted by

verbs are the basic domain and objects denoted by nouns function as modifiers. I also consider a situation as an instantiation of temporal properties, following Gabbay & Moravcsik 1980. Thus, I use 'Situation Time (ST)', when I make reference to the temporal properties of a situation. ST is defined in (13).

- (13) Situation Time (ST) is a set of instants or intervals of time denoted by verbs, the latter of which is designated as bound or non-bound by verb modifiers.

ST has a number of logical properties. I am interested here in the property that distinguishes ST from FT in particular. This property is seen in the part-whole relation in ST, if it is not just an instant of time in the case of instantaneous verbs. Part and whole exhibit a transitive property, as formally represented in (14), where $\leq$ means part-whole relation or part-of relation (cf. Abbott 1992, Bunt 1985).

- (14) $(\forall x, y, z)(x \leq y \ \& \ y \leq z) \rightarrow x \leq z$

(14) means that if x is part of y , and y is part of z , then x is part of z . I will not go into the formal apparatus of part-whole relations, but discuss some semantic properties of ST with respect to transitivity. ST differs from FT not only in that the former is an instantiation of temporal properties of the denotation of verbs while the latter is the denotation of some temporal expressions, but also in that ST and FT have different inferential patterns with respect to transitivity. In FT, we see an upward inferential pattern, as in (7), (8) and (9). In ST, we see an inferential pattern that is the reverse of that of FT, as shown in (15) and (16).

- (15) a. John read part of a book.
b. John is reading a book.
(16) a. John ran.
b. John is running.

Here, I assume that the verb phrases like *read part of a book* and *ran* denote a subsituation of the situation that the verb phrases like *is read a book* and *is running* denote. This assumption is supported by the fact that the b-sentence implies the a-sentence in (15), as the b-sentence does to the a-sentence in (16). I refer to this entailment relation in ST as 'downward', since inference is made only from

whole to part or larger part to smaller part. The downward inference pattern lies in that within a situation, part of it may be realized before a point of time while part of it may be not. Only a part or whole that is realized before that point of time contains parts realized before that point of time, though the parts unrealized before that point of time are still part of the whole situation. Thus, only the reverse of transitivity is seen in implications in ST. In the literature (cf. Bennett 1981, Dowty 1979, Kenny 1963), studies focus on the entailment of the a-sentence by the b-sentence in (16), while they ignore the entailment of the a-sentence by the b-sentence in (15), but emphasize the non-entailment of the a-sentence by the b-sentence in (17).

- (17) a. John read a book.
b. John is reading a book.

I think that those analyses are wrong. Why do they require (17b) to entail (17a), since (17a) refers to a whole situation, while (16a) only refers to a subsituation of (16b). Further evidence for the part-whole relation in ST is found in Finnish (cf. Chesterman 1991, Hoop 1992). In Finnish, verbal representations of part of a situation and whole situation may be seen in the grammatical cases that the object noun phrases bear, as illustrated in (18), where the partitive case is marked by the suffix *a* to the object noun.

- (18) a. John rakensi taloa
John built house_{PART}
John was building a/the house
b. John rakensi talon
John built house_{ACC}
John built a/the house.

The partitive case that the object noun phrase bears in (18a) indicates that the situation referred to by *build a house* is not complete and is partitive. The accusative case that the object noun phrase bears in (18b) shows that the situation is complete. Unaccusative is generally observed to be related to aspect interpretations (cf. Grimshaw 1990).

The double function of *for*-expressions as FT adverbial and as situation predicate is not adequately recognized in the literature on tense, aspect and temporal expressions. Binnick (1991) treats the distinction as a problem of scope phenomenon. Dowty (1979) treats the distinction as different syntactic categories. On the other hand, Carlson (1981) treats time expressions as some sort of measure of

time without such a distinction, since in her analysis the interpretation of *for*-expressions as FT adverbials or as situation predicates is left to pragmatics. I argue that *for*-time expressions represent ST and have semantic significance, when they function as VP adverbial, as in (19).

- (19) a. John ran *for half an hour*.
 b. John ran *for an hour*.
 c. John ran *for two hours*.

(19c) implies (19b) and (19a), and (19b) implies (19a), while the reverse does not hold. This downward inference pattern belongs to ST, as determined by the part-whole relation. A *for*-expression partitions ST denoted by a verb phrase, if ST is bound, as in (20).

- (20) a. John read a book.
 b. John read a book *for an hour*.

(20a) has a perfective reading, while (20b) has an imperfective reading, since ST denoted by *read a book* is partitioned by ST denoted by *for an hour* (cf. Dowty 1979:336).

Further evidence for situation predicates is found in Chinese, where temporal expressions occur in post-verb positions, in contrast to FT adverbials in (12). If there is an intransitive verb, a temporal expression appears right after the verb, forming a VP, as in (21).

- (21) a. Zhang pao le *liang xiaoshi*.
 John ran Asp. two hours
 John ran for two hours.
 b. Zhang zou le *yi tian*.
 John walk Asp. one day
 John walked for a whole day.

In a sentence with a transitive verb, the verb is copied and placed after the object noun phrase and before a ST expression, as in (22), where the temporal expression occurs following the copy of the verb.

- (22) a. Zhang *da* lanqiu *da* le *yige xiashi*.
 John play basketball play Asp. one hour
 John played basketball for an hour.
 b. Zhang *kan* shu *kan* le *yige xiawu*.
 John read book read Asp. one afternoon.
 John read a book/books for a whole afternoon.

In these structures, the temporal expressions must appear close to the verb so that no other elements may occur between the verb and the temporal expressions in sentences with intransitive verbs, as in (23a), nor can the copy of a verb be deleted, as in (23b).

- (23) a. *Zhang pao le *yi quan* liang xiaoshi.
 John ran Asp. a round two hours
 John ran a round (of something) for two hours.
 b. *Zhang *da* lanqiu le yige xiashi.
 John play basketball Asp. one hour
 John played basketball for an hour.

(23a) is ungrammatical when *yi quan* (a round) is inserted between the verb and the time expression. (23b) is ungrammatical when the copy of the verb *da* is deleted, in which case the time expression and the verb are separated by the object noun phrase. It is important to point out that this pattern of verb copying is also seen in the cases of instruments and locatives, as in (24) (cf. Li & Thompson 1981).

- (24) a. Zhang *xie* xin *xie* gangbi.
 John write letter write fountain pen
 John writes letters with fountain pens
 b. Zhang *chi* wufan *chi* shitang.
 John eat lunch eat cafeteria.
 John eats his lunch at cafeterias.

Instrument and locative are thematic roles that form part of the argument structure with event structures underlying (cf. Grimshaw 1990:25-9). Thus, instrument and locative noun phrases may appear after a copy of a verb as some kind of unaccusative object noun, since they are arguments in the argument structure. Given my assumption that time is an inherent dimension of an event structure or situations are instantiations of temporal properties, it is natural that situation predicates pattern after instrument and locative nouns as part of the argument structure. After all, event structures underlie argument structures.

In summary, I have argued for ST as a dimension of the representation of temporal relations in natural languages. ST exhibits unique logic behaviors such as downward entailment. Thus, *for*-expressions and other time expressions as FT adverbials and as ST expressions represent different dimensions of temporal relations. As a ST expression, a time expression forms an essential part of event

structures like other thematic roles.

4. Conclusion

I have argued that the syntactically-based sentential adverbials and VP adverbials actually represent different temporal relations in natural languages. I classify time expressions as FT adverbials and ST expressions. FT adverbials denote Frame Time: a set of intervals of time within which a described event/activity takes place or state holds. FT is characterized by temporal inclusions. Verbs and ST expressions refer to Situation Time: instants or intervals of time of verbal denotations. ST is characterized by part-whole relations.

The significance of my approach lies its insight into temporal relations in natural languages. However, previous approaches in semantics see time as something external by pairing a moment or interval of time with possible worlds in obtaining truth conditions for sentences (Montague 1973, Bennett 1981, Dowty 1979). They run into problems like 'the imperfective paradox' (cf. Dowty 1979, Zhou 1991) and time adverbial scope paradox (cf. Binnick 1991, Dowty 1982).

These two dimensions of the representation of temporal relations, together with a third dimension -- Linear Time that I argue for elsewhere (Zhou 1993), provide an account for a large range of linguistic phenomena with respect to time, such as aspect as viewpoint (cf. Smith 1991), the present perfect puzzle (cf. Klein 1992), demonstrative and anaphoric behaviors of time adverbials (cf. Partee 1973, Heny 1982), and other problems regarding tense, aspect and time expressions (cf. Zhou 1993).

NOTES

* This paper is based on three sections of my dissertation 'A study of temporal relations in natural languages with special reference to Chinese and English'.

¹ I use capital letters as the metalanguage representing scope difference here.

² I will not discuss how FT includes ST in this paper. The inclusion relations between FT and ST are the mechanisms for aspect as viewpoints (cf. Zhou 1993).

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TIMES AND CONDITIONS¹

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1. INTRODUCTION

This paper discusses the modern French construction of the form *Q que P*, exemplified in (1.)

1. a. Le chat est absent, que les souris dansent.
a'. The cat is absent, that the mice dance.
a". Whenever the cat is gone, mice dance.
b. À peine le chat est-il parti, que déjà les souris dansent.
b'. As soon the cat(*i*) is-it(*i*) left, that already the mice dance.
b". No sooner has the cat left than mice dance.
c. Le chat partirait-il, que les souris danseraient.
c'. The cat(*i*) leaves-would-it(*i*), that the mice dance-would.
c". If the cat leaves, mice will dance.
d. Le chat partirait-il, que les souris ne danseraient même pas.
d'. The cat(*i*) leaves-would-it(*i*), that the mice neg dance-would even not.
d". Even if the cat leaves, mice wouldn't dance.

This construction is characterized by the fact that the structurally subordinate clause *P* behaves logically like a main clause², as show the construction's paraphrases:

2. a. Quand le chat est absent, les souris dansent.
b. Alors que le chat est à peine parti, déjà les souris dansent.
c. Si le chat partait, les souris danseraient.
d. Même si le chat partait, les souris ne danseraient pas.

This construction must therefore not be confused with other constructions where the conjunctive *que* introduces a structurally and logically subordinate clause

3. a. Les souris n'auront de cesse que le chat ne parte.
a'. The mice will not rest (before, unless) the cat leaves.
b. Pars, que les souris dansent!
b'. Leave, so that the mice dance!

First will be discussed the interpretations that may be attributed to the construction; the role of *que* will then be addressed.

2. TIMES AND CONDITIONS

The construction may be interpreted as having either a temporal (see (1.a.), (1.b.))

4. a. Alexandre VIII le fit cardinal en 1690, qu'il n'avait que quarante ans. (D&P: 255)

b. La semaine ne s'était pas écoulée que le million projeté était rempli. (D&P: 255)

a hypothetical (1.c.)

c. Vous auriez un peu crié au voleur, que je ne l'aurais pas trouvé inconvenant. (LB: 332)

or a concessive value (1.d.).

d. Je serais libre de me marier demain, que je ne trouverais pas à la remplacer. (LB: 332)

The temporal interpretation suggests that the P clause event is either temporally included in (1.a., 4.a.), or immediately follows (1.b., 4.b.) that of the Q clause. In both cases, Q marks the temporal situation of the event expressed by P.

According to the data I could gather, the inclusion reading is rare³. It is found with repetitive events

5. Le chat part-il que les souris dansent.

and with a stative event in Q (see also (1.a.))

6. Tout s'était envolé que les Français tiraient encore (Grevisse 1986: 1561)

Most often, the temporal interpretation will receive a succession reading, which requires prominent aspectual marks. Thus, stative events don't allow succession readings, since they can't provide an adequate reference point for the main clause event beginning. Likewise, the present tense use is constrained with this reading (see Léard 1991).

7. ?* le chat part que les souris dansent.

The present tense being the reference point in the aspectual system, it doesn't provide for the proper differential marks, which must be implemented otherwise

8. *À peine* le chat part-il que *déjà* les souris dansent.

If these marks fail to appear, the utterance will be read as temporally inclusive with repetitive events; thus (7.) is marginally acceptable as meaning *Every time the cat leaves, mice dance.*

It is the nature of the verbs aspect which determines the singulative or repetitive reference of the events. Open aspect as expressed by imparfait, présent or conditionnel allows repetition, as opposed to passé composé, passé simple and futur simple closed aspect.

- 9. a. *À peine* le chat partait-il que les souris dansaient.
(repetitive, ?singulative)
- b. *À peine* le chat est-il parti que les souris dansaient.
(?repetitive, singulative)
- c. *À peine* le chat partait-il que les souris ont dansé.
(*repetitive, singulative)
- d. *À peine* le chat est-il parti que les souris ont dansé.
(*repetitive, singulative)

The succession reading presupposes the P clause event somehow took place sooner

- 10. a. *À peine* le chat était-il parti que les souris dansaient déjà.
- b. Le chat n'était pas encore parti que les souris dansaient déjà.

or later than expected (Le Flem, p. c.)

- c. Le chat était parti depuis une heure que les souris ne dansaient pas encore.

The temporal interpretation is found in the earliest periods of French

- 11. a. environ mienuit partismes du port d'Alixandre, qu'il faisoit bon temps et bon vent. (Tobler 1971: 126)
- b. Ils n'orent mie quatre lieues alé Qu'enmi la voie ont un vilain trové. (Tobler 1971: 126)

Both the concessive and the hypothetical interpretations indicate the conditions under which the main clause may be realized. They differ only through a presuppositional factor: the concessive reading presupposes that, while the realization of the Q event normally prevents that of the P clause, the P event takes place anyway. (12.) informs us that the mice dance when the cat is there, and presupposes that they should not do so in such a case

12. Le chat resterait que les souris danseraient quand même.

The hypothetical interpretation brings about no such presuppositions.

Both interpretations share the same general distributional properties, although hypotheticals are apparently used less frequently.

These interpretations may be characterized by the conditional form of the verbs

13. a. Le chat partirait que les souris danseraient.

b. Le chat partirait que les souris ne danseraient même pas.

or the subjunctive mood of the Q verb

14. Y eût-il songé, qu'il aurait sans doute attribué son zèle à la gravité du cas. (LB: 527)

More generally, they are difficult to infer from a closed aspect environment; examples under (15.) mean *quand Q, P* rather than *si Q, P*:

15. a. Le chat partira que les souris danseront.

b. Le chat partit que les souris dansèrent.

They are also characterized by the inversion of the clitic subject,

16. Le chat partirait-il que les souris danseraient.

an inversion which is used to express the possibility rather than the certainty of the existence of the event, as it expresses in interrogative contexts

17. Le chat partirait-il?

These semantically motivated inversions must be distinguished from those motivated by structural factors, such as the presence of an adverb at the head of the sentence

18. a. À peine le chat est-il parti que les souris se sont mises à

danser.

b. * Le chat est-il à peine parti que les souris se sont mises à danser.

Presuppositional elements like *même* and *ne ... que, seulement* will select a concessive interpretation rather than a hypothetical one.

The concessive interpretation is first found in Molière

19. Et je vous promettrai mille fois le contraire, Que je ne serois pas en pouvoir de le faire. (LB: 527)

This along with a number of other French constructions (Bogacki 1989) have the ability to evoke both temporal and hypothetical interpretations. Moreover, in this construction, both presuppositional and non-presuppositional readings are available for these interpretations, with a strong usage preference for the former. These facts lead to believe these interpretations share some significant common property: and indeed, temporal and hypothetical clauses specify the conditions prior to the realization of the clause they determine; the existence of these clauses event necessarily precedes that of the latter clauses.

Thus, this construction takes advantage of the iconic relationship between the temporal order of existence of the clauses' event (Guillaume 1971: 123, 202, Milner 1989: 512, 554, Piot 1991) and the linear order of the clauses themselves, an order that can't be changed

20. a. À peine le chat est-il parti que déjà les souris dansent.

b. ?* (*que) déjà les souris dansent, à peine le chat est-il parti.

c. Le chat partirait-il que les souris ne danseraient même pas.

d. ?* (*que) les souris danseraient, le chat partirait-il.

to suggest certain interpretations without using the lexical marking of an explicit functor like *quand* or *si*.

The question that then arises is, just how this relationship between the interpretations should be captured. My intuition is that the property of precedence need not be stated explicitly; it should follow from the definition of each interpretation. If it were to be defined as such, it would have the same status in a grammar as say the interpretations themselves: it would have to surface in a systematic fashion either as a morpheme or as a major semantic category governing a large amount of syntactic constructions: all of the hypothesis and time morphemes would then have to be derived from that

category, and one would expect them to always be ambiguous. An implicit approach avoids creating such problems while addressing fairly adequately the existing ones⁴.

3. THE SEMANTICS OF FUNCTORS

While most⁵ constructions have the same interpretation with or without *que*:

- 21. a. À peine le chat est-il parti, (que) déjà les souris dansent.
- b. Le chat partirait-il, (que) les souris danseraient.

its use imposes many structural constraints on the construction. It gives P the structural status of a subordinate clause. Thus, the P verb cannot be used in the imperative or interrogative form

- 22. a. Dès que le chat sera parti, dansez!
- b. * Le chat sera parti que dansez!

- 23. a. Si le chat part, danserez-vous?
- b. * Le chat part que danserez-vous?

The variable coreference is made difficult if the constant is in P,

- 24. a. Dès qu'il(*i*) fut parti, le chat(*i*) pensa aux souris.
- b. Il(*i*) fut parti que le chat(?**i*,*j*) pensa aux souris.

since targets of coreference are rarely located in structurally subordinate clauses⁶

- 25. Dès que le chat(*i*) fut parti, il(??*i*, *j*) pensa aux souris, qui dansaient.

(although there is this example

- 26. Est-ce que vous avez des amis de ce côté-là(*i*), que vous connaissez si bien Balbec(*i*)? (LB: 458))

Having *que* heading P makes it impossible to have another functor head Q, since there must be one structurally main clause in a complex sentence

- 27. a. Le chat est absent, que les souris dansent.
- b. Quand le chat est absent, les souris dansent.
- c. * Quand le chat est absent que les souris dansent.
- d. Le chat partirait-il que les souris danseraient.

- e. Si le chat partait, les souris danseraient.
- f. * Si le chat partait que les souris danseraient.

The fact that Q is structurally a main clause explains certain utterances of the form studied here may not have a paraphrase

- 28. a. L'univers aurait pu crever jusqu'au dernier homme, qu'il n'eût même pas failli à la moindre de ses habitudes. (LB: 527)
- b. * Même si l'univers avait pu crever jusqu'au dernier homme, il n'eût même pas failli à la moindre de ses habitudes.
- c. Même si l'univers avait crevé jusqu'au dernier homme, il n'eût pas failli à la moindre de ses habitudes.

So P is a subordinate clause. The fact that it can be paraphrased as a main clause (see (2.)) may be explained by the abstract semantic value of its functor.

Que may express the existence of the P clause as certain (Guillaume 1984: 50), given the frame of reference provided by the antecedent Q clause. This semantic value may of *que* be observed in other contexts, when opposed to *si*

- 29. a. Je sais *que* le chat partira.
- a'. I know *that* the cat will leave.
- b. Je sais *si* le chat partira.
- b'. I know *whether* the cat will leave.

The use of *que* suggests that the existence of the event introduced is certain, whereas the existence of the event introduced by *si* is presented as possible.

The factual value of *que* has been used to introduce independent clauses in earlier periods of French

- 30. La compagnie du comte de Tende estoict lieutenant ce jour-là de garde; que le capitaine Taurine en estoict lieutenant. (Nyrop 1930: 349)

Thus, the construction under study is characterized by the choice to mark with *que* the certainty of the P clause, instead of having the conditional value of the Q clause marked by another functor like *quand* and *si*.

4. CONCLUSION

The iconicity between the strict linear order of the clauses and the necessary order involved in temporal and hypothetical relationships

determines both structural aspects and the specific interpretations of the construction *Le chat part que les souris dansent*. The functor *que* is used to introduce the logically main clause; it marks the certainty of its realization, given the conditions expressed by the antecedent clause.

5. ENDNOTES

1. I would like to thank Daniel C. Le Flem, Jacques Ouellet, Patrick Duffley and Pierre-Yves de la Garde who accepted to read and comment this paper. Thanks also to Lionel Boisvert who helped me with the historical facts. All the remaining mistakes are my own.

2. Grevisse (1986: 1064) considers that in (a.), P is a subordinate clause, that must be paraphrased by (b.)

a. La pluie avait cessé que nous allions encore à toute vitesse.

b. La pluie avait cessé alors que nous allions encore à toute vitesse.

In certain temporal contexts - as opposed to intransitive relationship contexts like that of hypothesis -, both clauses may be used to landmark the other without apparently changing their semantic content,

c. J'étais encore couché, que les premiers visiteurs arrivèrent. (Tobler 1971: 128)

d. Ils arrivèrent que j'étais encore couché. (Tobler 1971: 128)

However, both clauses do not have the same semantic value: the Q clause temporally situates the P clause that is the purpose of the utterance. The clauses of (a.) are therefore not freely interchangeable, and it is (e.)

e. Alors que la pluie avait cessé, nous allions encore à toute vitesse.

not (b.), that adequately paraphrases it.

3. It doesn't belong to the usage of all speakers; thus, Professor Le Flem doesn't accept examples (1.a.), (5.) and (15.); however, he accepts (4.a.) because of the presence of the presuppositional element *ne ... que*.

4. Moreover, an explicit approach would have to explain why the construction can very rarely have a causal interpretation,

a. Il tousse que personne ne peut dormir. (Nyrop 1930 : 157)

despite the fact that cause clauses, too, specify the conditions prior to the realization of the clause they determine.

5. In fact, non-presuppositional readings hardly allow the absence of *que*

- a. Le chat est absent, que les souris dansent.
- b. ?? Le chat est absent, les souris dansent.
- c. Le chat partirait-il, que les souris dansent?
- d. * Le chat partirait-il, les souris dansent?

6. *Que* also blocks agreements in other constructions (see Larrivée 1993)

- a. Gentilles, ces souris!
- b. * Gentilles que ces souris!

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SUBJECT, TOPIC AND COORDINATE CONJUNCTION MARKERS IN KOREAN

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The subject particle -i / ka in Korean occurs freely inside a conjoined clause, while the topic marker nun has some restrictions of occurrence in that environment. This formal difference follows from the semantic characteristics of subject and topic. In addition the semantics of the Korean conjunctions ko 'and', kose 'and then', ese 'and so', and myu 'and: while' and the semantics of topic share an attention getting character, while sharing a contrast in their ability to indicate distance or separation of the conjoined elements.

According to Li and Thompson (1976), Korean is a subject and topic prominent language (type 3). In Korean, -i / ka is sometimes called the subject marker, (-i is used after a consonant and -ka is used after a vowel.), and un / nun is referred to as the topic marker (-un appears after a consonant and -nun after a vowel.). The topic and subject markers both may normally occur in sentence initial position, and it is sometimes difficult to identify the semantic contrast which accompanies the occurrence of the one or the other.

1. Topic vs Subject marker in Korean

1.1. Old vs new information carrier

Korean grammarians (Yang 1973, Shin 1987, Kim 1983, and Chae 1976) generally agree that the subject marker -i/ka occurs with the new information in the discourse, and that the topic marker un/nun occurs with the old information. Their common view of topic is that topic is the 'given' or 'old' element of the sentence and must be semantically definite. Generic notions with unique reference (the sun, the moon, etc.) are also included in the definite group. Indefinite elements cannot co-occur with the topic marker nun. But the factors involved in the conditioning of topic as subject can not be restricted to the narrow sentence scope and must include the larger discourse context. Association of the topic marker with the notion of 'old' (or 'given') and the subject marker with that of 'new' derive from the assumption (cf. Chafe 1976, Allerton 1978, Gundel 1977) that the occurrence of the topic marker is predictable when there is previous mention of the same NP referent in the preceding context. In other words, for an NP to be 'old' information, there has to be previous mention of the referent in the preceding

context. (cf. Shin 1987, Sohn 1980, Maynard 1981). Conversely, 'new' information arises from the absence of previous mention in the preceding context. In actual discourse, if the topic marker marks the old information, and the subject marker indicates new information, then the introductory sentence in the discourse should use the subject marker ka, since it normally codes new information. And the subsequent sentences should use the topic marker, since the participant has already been introduced.

1.2. Attention getting character

So far we have mentioned 'old' and 'new' information in regard to the topic and the subject markers. However, there is another feature of the Korean topic marker nun which is very relevant to the current discussion in relation to the additional conjunction markers ko, kose, ese, and myu. This added characteristic of the topic marker is 'attention getting,' or 'contrastive focus' in function. The question is how the 'contextually prepared' information carrier nun can be the 'focus getting' marker. Nun is the topic marker and is expected to carry the 'contextually more determined' information. It can not be highlighted as the center of the attention, because usually the 'contextually indeterminate' information carrier NP+ka is supposed to get the information focus. However, NP+ka does not carry any special stress or emphasis. For example:

- (1) Kim-un ipputa
 Kim-tp pretty
 '(Speaking of)Kim, (she) is pretty.'
- (2) Kim-i ipputa
 Kim-sm pretty
 'Kim is pretty.'

Without context, sentence (2) is a more plain (in terms of stress) sentence than sentence (1). The subject marker ka does not require any special attention. The 'attention getting' character of the topic marker is more obvious in the 'double subject' construction.

The so called 'double subject' construction is a characteristic of topic prominent languages. Double subject means that in one clause, there are two participants, one of which takes a topic marker and the other, a subject marker. The usual assumption is that the topic lies outside the predicate-argument relations. However, the word order is relatively free. Consider the following example:

- (3). a. ?John-un meori-nun chota
 John-tp brain-tp good
 '?Speaking of John, he is smart. (though probably not)'
- b. ?? meori-nun John-un chota
 brain-tp John-tp good
 '?? John is smart. (If you talk about smartness, and talk about John.)'

- c. John-i meori-ka chota
 John-sm brain-sm good
 'John is smart.'

Sentence (3 c) is acceptable, but (3 b) is not acceptable and (3 a) is somewhat acceptable depending on the individual. The contrastive meaning ('smart' vs 'handsome') of (3a) is achieved better in (3 d).

- (3) d. John-i meori-nun chota
 John-sm brain-tp good
 'John is smart. (but not handsome)'

Two topic markers in one clause are sometimes at odds with each other. The reason for this is that topic marking is a device that is used by the speaker to direct the hearer's attention to a particular NP in a clause; therefore, using the topic marker twice in the same clause causes a perceptual dissonance in determining the speaker's intention with regard to the attention focus in a given clause. The occurrence restriction of the topic marker in relative clauses and conditional clauses is essentially the same as the cooccurrence restriction on double topic in one sentence. It is the speaker's choice of a particular NP or a proposition that is to be contrasted with the non-chosen ones. The nun attached NPs, especially in contrast with their ka attached counterparts, appear to be highlighted as the center of the speaker's attention to attract the listener's attention, whereas the ka attached NPs are free from such additional functions.

1.3. Distance creating function of topic

The third characteristic of the topic marker nun is that it creates distance between the topic NP and the rest of the sentence. The topic marker singles out or topicalizes the NP referent and signals to the hearer that the speaker is intentionally putting some distance between the topic NP and the rest of the sentence. Chae (1991: 91) states that there is a pause between the topic and the rest of the sentence. Thus when you put another clause between the agent and the predicate marking the agent as topic is grammatical, but marking the agent as subject is not grammatical. For example:

- (4) a. *ne-ka he-ka tul-myun whabun-ul changka-e
 I-sm sun-sm come in-if flower pot-om window edge-at
 nenot-nun-ta.
 put-pre-ind

*'If the sun comes out, then I will put the flower pot in front of the window.'

- b. na-nun he-ka tul-myun whabun-ul changka-e
 I-tp sun-sm come in-if flower pot-om window edge-at
 nenot-nun-ta.
 put-pre-ind

'If the sun comes out, then I will put the flower pot in front of the window.'

In (4 a) when the 'if clause' is inserted, the sentence is unacceptable since the agent is subject marked, but in (4 b), the agent is topic marked and the sentence is acceptable. Thus when the agent is topic marked, that agent is separated out from the rest of the sentence, and there is a pause or cognitive distance between the topic and the rest of the sentence.

2. Conjunction markers and the topic marker

2.1. ko and kose

When in a complex sentence the clauses are connected by ko or kose, and have a different agent in each clause, the acceptability of the sentence varies depending on whether the agent is marked by the topic marker or the subject marker. Consider the following examples:

- (5) a. Mary-ka ttuioka-ko John-i keoleoka-ss-ta
 Mary-sm run-and John-sm walk-past-ind
 'Mary ran and John walked.'
- b. Mary-nun ttuioka-ko John-un keoleoka-ss-ta
 Mary-tp run-and John-tp walk-past-ind
 'Mary ran and John walked.'
- c. Mary-ka ttuioka-ko John-un keoleoka-ss-ta
 Mary-sm run-and John-tp walk-past-ind
 'Mary ran and John walked.'
- d. Mary-nun ttuioka-ko John-i keoleoka-ss-ta
 Mary-tp run-and John-sm walk-past-ind
 'Mary ran and John walked.'
- (6) a. Mary-ka ttuioka-kose John-i keoleoka-ss-ta
 Mary-sm run-and John-sm walk-past-ind
 'Mary ran and then John walked.'
- b. *Mary-nun ttuioka-kose John-un keoleoka-ss-ta
 Mary-sm run-and John-sm walk-past-ind
 *'Mary ran and then John walked.'

- c. Mary-ka ttuioka-kose John-un keoleoka-ss-ta
 Mary-sm run-and John-tp walk-past-ind
 'Mary ran and then John walked.'
- d. *Mary-nun ttuioka-kose John-i keoleoka-ss-ta
 Mary-tp run-and John-sm walk-past-ind
 *'Mary ran and then John walked.'

In (5), either the topic marker nun or the subject marker ka is grammatical when it is added to the agents of two clauses conjoined by ko; but in (6), only ka is allowed as the NP marker inside the first clause, when kose is used as the conjunction marker. If two clauses have the same referent as subject, there is no problem. Observe the following examples:

- (7) a. Kim-un ileona-ko(se) pap-ul muk-ess-ta
 Kim-tp woke up-and then rice-om eat-past-ind
 'Kim woke up and then ate.'
- b. Kim-i ileona-ko(se) pap-ul muk-ess-ta
 Kim-sm woke up-and then rice-om eat-past-ind
 'Kim woke up and then ate.'

As can be seen from the above example, if the events have the same referent as agent, either the topic marker or the subject marker occurs. Let us look at some additional examples:

- (8) a. Kim-i tteona-ko(se) Mary-ka tteona-ss-ta
 Kim-sm left-and then Mary-sm leave-past-ind
 'Kim left and then Mary left.'
- b. *Kim-un tteona-kose Mary-ka tteona-ss-ta
 Kim-tp left-and then Mary-sm leave-past-ind
 *'Kim left and then Mary left.'
- c. ?Kim-un tteona-ko Mary-ka tteona-ss-ta
 Kim-tp left-and then Mary-sm leave-past-ind
 ?'Kim left and then Mary left.'

In (8 a), when ko is used in the sense of 'sequential ko' or when kose is the conjunction, and there are two different subjects, both subjects take the subject marker ka. However, (8 b) and (8 c) are not acceptable when the first subject takes the topic marker. But on a scale of grammaticality, (8 c) is more acceptable than (8 b). Sentence (8 c) can be completely acceptable if there is a past tense marker inside the first clause. Observe the following:

- (8) d. Kim-un tteona-ss-ko Mary-ka tteona-n-ta
 Kim-tp left-and then Mary-sm leave-pre-ind
 'Kim left and then Mary is leaving.'
- e. *Kim-un tteona-ss-kose Mary-ka tteona-n-ta
 Kim-tp left-and then Mary-sm leave-pre-ind
 *'Kim left and then Mary is leaving.'

In (8 d), the past tense marker -ss is used in the first clause. The difference between sentences (8 c) and (8 d) is the time duration between two events, i.e. 'Kim's leaving' and 'Mary's leaving', are very closely associated in (8 c), but in (8 d) Mary's leaving is not so immediate. Or, if we put the past tense in the first clause and put a temporal adverb in (8 c), it is even better. Observe the following:

- (8) f. Kim-un tteona-ss-ko Mary-ka jikum tteona-n-ta
 Kim-tp left-and then Mary-sm now leave-pre-ind
 'Kim left and Mary is now leaving.'
- g. *Kim-un tteona-ss-kose Mary-ka jikum tteona-n-ta
 Kim-tp left-and then Mary-sm now leave-pre-ind
 *'Kim left and Mary is now leaving.'

Let us consider another example:

- (9) a. bi-ka o-ko(se) param-i bunta
 rain-sm come-and then wind-sm blow
 'Rain comes and then wind blows.'
- b. *bi-nun o-kose param-i bunta
 rain-tp come-and then wind-sm blow
 *'Rain comes and then wind blows.'
- c. ?bi-nun o-ko... baram-i bunta
 rain-tp come-and wind-sm blow
 ?'Rain comes... and wind blows.'

Sentence (9 b) is unacceptable, while sentence (9 c) is a bit odd but not ungrammatical, although it lacks the immediate temporal ordering of (9 b), i.e. between the two events 'rain' and 'wind blows.' The two events in (9 c) are somewhat more independent than (9 a) or (9 b). A nun in the first clause damages the resulting sentence in which ka appears in the second clause, regardless of ko and kose, but a ka does not. Why? The effect of putting past tense -ss in the first clause or putting a pause after the first clause is congruent with putting some distance between the two clauses. nun singles out or topicalizes the NP (here bi 'rain') and signals to the hearer that the speaker is intentionally putting some distance between the first event and the second event. If two clauses are too close semantically, then the speaker does not use the topic marker nun.

Therefore, we can conclude that when there are two agents, and if the first clause takes the topic marker nun in a kose conjoined clause, it is not grammatical. If it is a ko conjoined clause, the topic marker nun in the first clause is acceptable, if the first clause has the tense marker inside, or there is some cognitive space after the first clause. In other words, the pattern

*nun.....ka

is not possible with kose, but it is possible with ko, if there is some distance between the two events. But the pattern

ka.....nun

will succeed with kose as with ko. This is also related to the semantic character of the conjunction ko and conjunction marker kose. When there are distinct referents as agents in kose conjoined clauses, the sense of kose is that there is a time sequence between the first event and the second event so that kose signals that the two events are sequenced. In other words, kose has a time sequencing character in addition to the successivity or connectivity feature of ko. Because of this character of kose, the two events are more immediately related, and there can be no pause distancing the two events.

As we saw earlier, the topic marker creates some distance between the first and the second event. Thus, putting the topic marker nun inside the first clause is not acceptable. However, in case of ko, the topic marker can occur inside the first clause. I suspect that this is somewhat related to the fact that relative clauses in Korean can not take a marker nun inside the relative clause, nor can a -myun 'if' clause take nun inside the if-clause. This is congruent with the consideration mentioned above that Korean speakers do not like to have two topics in a one-semantic-unit clause. The agent of the second clause is the topic of the sentence, and if there is another topic marker inside the first clause, it divides the listener's attention. If two clauses have equal status as with coordinate clauses, then the two two clauses each have a topic marker, but if the first clause is subordinated to the second clause, the first clause will not normally have the topic marker inside, since the subordinating clause is the background clause and is not intended to get the speaker's or hearer's focal attention. The conjunction kose, like the relative marker or -myun 'if,' is tightly related to the second sentence. If the two events are close and immediately related, then putting the topic marker nun inside the first clause damages the resulting sentence. In other words, the conjunction marker kose is a subordinating marker. Another reason is that the topic marker nun and the conjunction markers share some common characteristics, probably they both attract contrastive (between two NP) focus and demand high pitch at the same time. Therefore, speakers attempt to avoid the clash between them. Events with the same agent take the nun marker inside the first clause. But events with different referential subjects are more problematic. There is a contrast between the two subjects in the two clauses, and the subordinate or background clause subject can not bear the contrastive focus, because speakers must pay attention to the subject of the foregrounded second clause. If there is a subject in the backgrounded clause which requires contrastive focus, it confuses the listener. This is not the case with clauses connected by ko, since the two clauses have equal focus. Thus the two subjects can get equal contrastive focus.

Now we turn to the conjunction ese to examine its behavior with respect to kose or ko.

2.2. ese

- (10) a. John-i il anhe-se Mary-ka ilhe-ss-ta
 John-sm not work-and so Mary-sm work-past-ind
 'John did not work, therefore Mary worked instead of him.'
- b. ?John-un il anhe-se Mary-ka ilhe-ss-ta
 John-tp not work-and so Mary-sm work-past-ind
 '?John did not work, therefore Mary worked instead of him.'
- c. John-i il anhe-se Mary-nun ilhe-ss-ta
 John-sm not work-and so Mary-tp work-past-ind
 'John did not work, therefore Mary worked instead of him.'
- d. *John-un il anhe-se Mary-nun ilhe-ss-ta
 John-tp not work-and so Mary-tp work-past-ind
 *'John did not work, therefore Mary worked instead of him.'

Also sentence (10 b) is less acceptable than (10 a), and if there are two topic markers in the clause, it is not acceptable at all as is demonstrated in (10 d).

2.3. myu

There are two main functions of myu. When myu is used as the meaning of 'while....', 'at the same time....', the subject of the two clauses should be identical. For example:

- (11) John-un piano chi-mye nore-rul buleo-ss-ta
 John-tp piano play-and sing-om sing-past-ind
 'John played a piano and sang a song at the same time.'

When myu is used as 'co-present myu' the subjects of two clauses can be either referentially identical or different.

- (12) seroun tosi-ka sengki-myu kun kil-i
 new city-sm come into being-if big road-sm
 sengki-n-ta
 come into being-pres-ind

'New towns are coming into being and a big road is coming into being.'

In sentence (12), there are two subjects. In this case, myu codes 'co-presence.' Participants in 'co-present' clauses can take a topic marker as in myu clauses, too. Observe the following examples:

- (13) a. ku-jip-un jibung-un para-ko byuk-un hayata
 that-house-tp roof-tp blue-and wall-tp white
 'The roof of that house is blue and the wall is white.'
- b. ku-jip-un jibung-un para-myu byuk-un hayata
 that-house-tp roof-tp blue-and wall-tp white
 'The roof of that house is blue and the wall is white.'

In sentence (13), the first and the second verbs are both the stative verb 'be.' Here ko and myu are used interchangeably without any problem. However, myu is not substitutable for ko when the first and the second verbs are active verbs. Observe the following:

- (14) a. John-un nol-ko Mary-nun kongbuha-n-ta
 John-tp play-and Mary-tp study-pre-ind
 'John plays and Mary studies.'
- b. *John-un nol-myu Mary-nun kongbuha-n-ta
 John-tp play-and Mary-tp study-pre-ind
 *'John plays and Mary studies.'

The reason for the oddness of (14 b) is apparently due to another characteristic of myu. It has the meaning of 'at the same time' when the two verbs are active, and thus it creates oddness when the two verbs are active and have different subjects. Since two different subjects are behaving at the same time, the indication of two different simultaneous actions is not easily acceptable. But it is acceptable when the two verbs are stative (here 'to be high' and 'to be deep') and have two subjects, because in that case, the strong sense of simultaneity of myu is there but no action is required.

Myu thus does not take a double subject if it has the sense of 'simultaneity.' In other words, it allows only a same subject clause. If it is used with the sense of 'co-present,' the verbs are either stative or passivized. The subjects of the stative or passivized verbs either take the topic marker nun or the subject marker ka freely. This distribution is represented in the following Table 1.

	<u>ka</u> ... <u>ka</u>	<u>ka</u> ... <u>nun</u>	<u>nun</u> ... <u>ka</u>	<u>nun</u> ... <u>nun</u>
ko	+	+	+	+
kose	+	+	-	-
ese	+	+	-	-
myu(copresent)	+	+	+	+

Table 1

3. Conclusion

The subject particle -i / ka in Korean freely occurs inside the conjunction clause, but the topic marker nun has some restrictions on its occurrence in conjoined clauses. The difference is due to the characteristics of the subject and topic markers. The reason the relative or 'if-clause' or kose or ese clause does not allow nun marking is related to the nature of the topic marker and the conjunction marker. Events with same subject take the nun marker inside the first clause. But events with different subjects are more problematic. The first reason is the necessity to avoid having a topic in the subordinate clause. If there is a contrast between the two subjects in the two clauses, the subordinate or background clause subject can not bear the contrastive focus, because speakers must pay attention to the foregrounded second clause and thus to the subject of the main clause. If there were a subject in the backgrounded clause which requires contrastive focus, it would give two topic signals to the listener and is thus avoided. This is not the case with clauses connected by ko, since the two clauses have equal status. Thus the two subjects can get equal contrastive focus. If there are two topics which require high pitch or stress, speakers attempt to avoid the clash between them. The subordinate clause is used to encode background information, the conjunction marker and the main clause are at the focus of attention. Thus, subordinate clauses do not allow another focus getting attention focus marker nun inside the clause. A possible explanation for this is that the hearer would be confused if there were multiple attention getting markers in one utterance.

Another reason for avoiding the use of nun in the conjunction clause is that the topic marker nun puts some distance between the two events in a complex sentence, but the subject marker ka does not. The conjunction kose like the relative marker or -myun (if) has a tighter relationship to the second clause than ko. If the two events are close and immediately related, then putting the distance making topic marker nun inside the first clause damages the resulting sentence. However, in the case of ko, putting the topic marker inside the first clause does not cause a problem.

One notion associated with Korean nun and ka, which is problematic, is equating 'old' and 'new' information with nun and ka respectively. 'Old' information is 'given' and presupposed, and it does not bear the attention focus. 'New' information is unknown to the hearer, and it occurs at the focus of attention. My study of spoken Korean discourse shows that this 'old' and 'new' dichotomy does not work. Zubin (1979: 470) says that the cognitive limits of human capabilities force us to choose one entity or event at a time as the most salient item, because humans can not pay equal attention to everything that is involved in the discourse process.

I have found that as the conjunction marker indicates more subordination of the conjoined clauses, as with kose, or ese, the more difficult it is to use the topic marker nun inside the clause, enabling the use of the subject marker ka instead. Other Korean linguists (S. Bak 1983, S. Kim 1983, etc.,) are also aware of these contradictions of the 'old' and 'new' hypothesis, although they do not take the perspective of the subordinate clause that I take. Thus, Bak says that nun has a speaker-oriented 'aboutness' semantic character, and S. Kim (1983:66) says that nun has the function of highlighting an item that is chosen as the center of the

attention. D. Yang (1973) also says that the function of contrastive focus and the topic function of nun are inseparable, like the two sides of coin. Shin says that the highlighting function comes from the contrastive focus function of nun.

However, none of these scholars can explain why the topic marker (although ka is the new information carrier) can highlight an item so that it gets the focus. My position will be that the function of nun is to maintain topic continuity in the discourse by identifying the NPs that require the speaker/hearer's immediate attention. Another claim is that the topic marker always codes the attention getting focus in sentence initially and non-initially. This departs from the traditional theory that only the non-initial topic marker nun has the contrastive focus function. Bak (1981: 321) also points this out.

What I claim is that Korean ka can not be categorized as a subject marker which carries the new information. Ka is more like a basic nominative marker which does not require any attention. In other words, it is more subordinate than *nun* and a non-topical information carrier.

The fact that the topic marker nun does not occur inside the kose clause, gives a kose sentence a tighter relationship between the first and the second events than the coordinate marker ko. Thus speakers treat the kose clause as more backgrounded than the ko clause. It is easier to place a topic marker inside the clause in ko conjoined clauses. Ese has the same character as kose in not permitting the topic marker nun inside the ese clause. Ese also does not allow the two topic markers occur simultaneously in the first and the second clause. Myu does not take an overt subject in the first clause, if it has the sense of 'simultaneity.' If it is used with the sense of 'co-present,' the verbs are either stative or passivized. The subjects of the stative or passivized verbs either take the topic marker nun or the subject marker ka freely.

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FEATURES AND FUNCTIONAL CATEGORIES¹

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In present syntactic theory (e.g. of a Government-Binding or Minimalist kind), functional categories are very important for determining word order. **Functional** categories are grammatical, non-lexical categories such as I(nflection), C(omplementizer) and D(eterminer). They are structural positions but also function as holders of collections of features. In Chomsky (1986), tense and agreement features are situated in the I(nflection)-position and the structural position is separate from the features that occupy it. In later work, this changes.

Since Pollock (1989) and Chomsky (1989; 1992), only certain features (V and N features) are linked to specific positions. This means the I-position is split in a T(ense)-position and an AGRs(agreement with the subject)-position and tense and agreement features are automatically linked to 'their' functional categories. I will argue against such a link-up for two reasons: (a) not all languages make use of all functional categories, and (b) certain languages place features in other positions.

The outline of this paper is as follows. In section 1, I provide some background on functional categories and in sections 2 and 3, I discuss the arguments that features and categories are separate from each other. Thus, the main thesis of this paper is that structural positions are independent of functional features.

1. Functional Categories

In early transformational syntax (e.g. Chomsky 1965) and even in later work (Chomsky 1981), Phrase-Structure Rules refer to lexical (N, V, A, P) as well as to functional categories (C, INFL, Det). However, the main categories are the **lexical** ones. For instance, Chomsky (1970: 210) generalizes the necessary Phrase Structure rules to (1) and (2), where a functional element such as the determiner is analyzed as [Spec, N'] and the auxiliaries are analyzed as [Spec, V']:

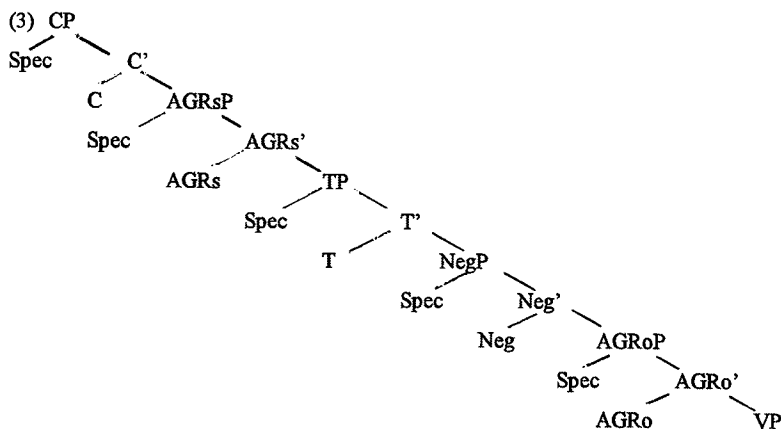
- | | | | |
|-----|----|-----|---------------|
| (1) | X' | --> | [Spec, X'] X' |
| (2) | X' | --> | X ... |

Thus, what we now think of as functional categories cannot be X in (1) or (2); they can only be [Spec, X'] and since they are not heads, they cannot subcategorize for complements. Jackendoff (1977: 33) writes in a similar vein that "[t]here is no place in this system for coordinating conjunctions and complementizers. However, they do not participate in the grammar in the same way as the other categories, in that they do not strictly subcategorize complements and specifiers, so their exclusion is motivated".

Chomsky (1986), based on, e.g., work by Fukui & Speas (1986) and Fukui (1986) argues that the non-lexical, i.e. functional, categories are no different from the lexical ones in that they can be heads (i.e. X) in (1) and (2), and can have complements and specifiers. So they are in accordance with X'-theory. As a result, S' becomes CP and S becomes IP. As mentioned, Chomsky (1989; 1992) and Pollock (1989) split up the I-position into two (T and AGRs). Apart from these two functional categories, there are a number of others. Relevant first of all is this possibility of unlimited numbers of functional categories. In relation to language learnability,

there are several approaches one might take. Assuming that Universal Grammar makes functional categories available to the language learner, one could say (a) they are available in all languages even though they may be 'inactive' in a given language, or (b) a language learner, on the basis of contact with the language surrounding her or him, selects certain functional categories to be part of the analysis for that language. I argue in favor of (b) in this article.

Apart from T and AGRs, other functional categories exist. Pollock suggests that a TP, Neg(ation)P and AGR(eement)P exist. Chomsky splits up the AGRP as well, into AGRsP and AGRo(agreement with the object)P and places TP in between them as in (3). (In this article, I will not go into AGRo and Neg):



The reason for postulating AGRs is that it eliminates the odd dual function of I, i.e. as a holder for tense as well as a holder for agreement features. Actual evidence is not discussed by, for instance, Chomsky (1989; 1992). One of the advantages of postulating AGRs (and AGRo) is that it may be possible to say "that structural Case generally is correlated with agreement and reflects a government relation between the NP and the appropriate AGR element" (Chomsky 1989: 18); "[w]e now regard structural Case as an expression of the SPEC-head relation, with the head being AGR and the NP with Case in the SPEC-AGR position" (Chomsky 1992: 5). There is no actual empirical evidence for a second functional node in English between C and *not* which I discuss in the next section.

Functional heads, according to Chomsky (1992), contain V and N-features. Verbs must move to these heads to check their features with the V-features of the head; NPs move to the Specifier of the functional category to check their features. Thus, Verbs and NPs are selected from the lexicon with all their inflection present. The difference between languages comes about whether checking occurs overtly or covertly. The assumption is that overt movement is more 'costly' than covert movement and all things being equal movement will occur at Logical Form (i.e. covertly). Overt movement only occurs when the features in the functional head are strong and have to be checked before Phonological Form.

2. The absence of functional categories

Several linguists have argued that the grammars of certain languages do not include a C(omplementizer), T(ense) or D(eterminer). For instance, Lenerz (1985) argues that Old High German does not have a C; Fukui (1986) maintains Japanese lacks a D and I (i.e. AGRs and T);

and Kornfilt (1991) holds that Old Turkic lacks functional categories. In this section, I will briefly review my own evidence on functional categories in English (based on van Gelderen 1989; forthcoming). I show in this section that there is empirical evidence for one functional category between C and the sentential Negation in English.

It has been argued since Akmajian, Steele and Wasow (1979) that *to*, *do* and modals are in a category separate from VP. They occur in complementary distribution as in (4) to (6) and VPs can be deleted without *to*, *do* or the modal being deleted as well as in (7) to (9):

- (4) *that he **may** to work.
- (5) *that he **may** can work.
- (6) *that he **may** do work.
- (7) She tried to catch the bus and he tried to (also).
- (8) She didn't catch the train and he didn't.
- (9) She didn't catch the flu but he will.

Sentences (4) to (6) show that between C and the modal, *do* or *to* in T, no verbal element can occur (this verbal element is in bold). The same argument in a slightly different form can be made on the basis of sentence (10). It shows that having two functional categories between C and *not* results in an ungrammatical sentence:

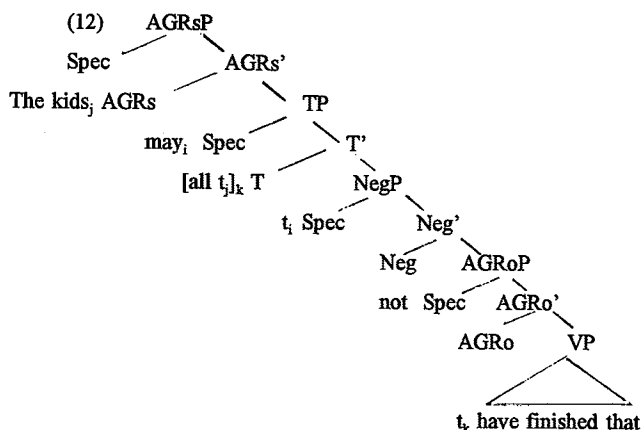
- (10) *This work **may** have not been finished.

These facts can be accounted for if T always moves to AGRs which Chomsky (1992: 10) claims² but it means there is no structural evidence for a functional position between C and T. It is not important which name one gives to the node that is present.

Apart from (10), there is another problem, namely, that Spec TP is not present in addition to Spec AGRsP. If Spec TP were there as well as Spec AGRs, this would be a position in which the element *all* should be able to appear since the subject on its way from Spec VP to Spec AGRsP would have moved through it (cf. Sportiche 1988). However, sentences such as (11) are ungrammatical:

- (11) *The kids may all **not** go there.

In (11), with a structure as indicated in (12), *the kids* is in Spec AGRsP, *may* is in AGRs, *all* is in Spec TP and *not* is in Neg. This sentence is ungrammatical, indicating that there is only one Specifier position before *not*, not two:



The same is true in (13), where an adverb (indicating the left boundary of VP) follows two auxiliaries. If both Spec AGRsP and Spec TP were present one would expect such sentences:

- (13) *The kids may all yesterday have gone there.

In conclusion to this section, V and N-features cannot be situated in T and AGRs since one of these is not present in English. Tense and agreement features will have to be checked in one position, either T or AGRs. The idea that certain features are not always in one particular position will be discussed in more detail in the next section where I argue that in some dialects of English agreement features are situated in C.

3. Agreement features in C

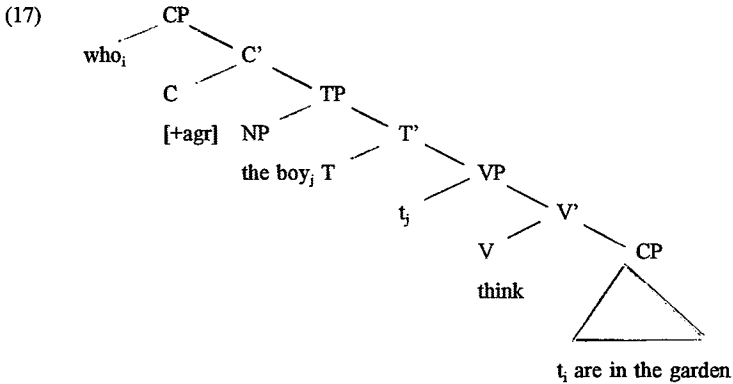
If not all functional categories are present in a language, what happens to the features? In Dutch, there is evidence that tense features are in C (as for instance den Besten 1983 argues). In some English dialects, this seems also to be the case even though normally the tense features occur in T.

There are some dialects of English that may be argued to have agreement features in C indicating the agreement features are not always situated in the same position. Kimball and Aissen (1971) describe a variety of English that allows relative clauses as in (14) and (15) but not in (16):

- (14) The people _{CP}[who_i the boy think _{CP}[t_i are in the garden]].
 (15) The people who the boy think t the girl know t are in the garden.
 (16) *The people who t think that John know the answer.

There is an unusual agreement between the *wh*-element and the Verb which is only possible if the *wh*-element originates or moves through the Spec CP of the clause in which the Verb is situated as in (14) and (15). To explain this, one could argue that agreement features are

optionally placed in the C of the relative clause³ as in (17). When they are placed in C and the *wh*-element moves through Spec CP, the Verb (after V-raising at LF) will agree with the *wh*-element through Spec-Head agreement:



These data are compatible with Rizzi (1990: 52) who argues that agreement is in C for certain languages. Others, for instance, Belletti (1992) have argued the same point. Belletti argues that AGR moves to C to ensure nominative Case in participial constructions. The same result could be obtained by having agreement features in C.

4. Conclusion

In this paper, I have argued that features do not automatically belong to a particular functional category. My main thesis is that functional categories perform a dual function. On the one hand, they are structural positions in that they are occupied by elements such as *to*, *do* or modals and in that their Specifiers contain maximal projections. On the other hand, they are holders of features that force certain elements to move to functional Heads and their Specifiers.

My argument runs as follows. First, there is evidence that in English there is only one functional category between C and Neg, not two as in Chomsky (1992). If that is indeed the case, agreement and tense features will both have to occupy this position which I call T. Second, certain dialects can be accounted for if agreement features are in C. This shows that there is no necessary connection between features and functional heads.

For the theory of Universal Grammar this will mean that Universal Grammar makes accessible certain structural positions and features but that learners select which positions to include and where to put certain features on the basis of available data.

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Notes

1. The proposal to clearly disassociate features and structural positions also appears in van Gelderen (1992; forthcoming).
2. Movement of T to AGRs is necessary since the Case features of AGRs depend on T (Chomsky 1992: 10). If T did not move to AGRs, a theory-internal argument for the existence of both TP and AGRsP could be derived from the position of adverbs such as *probably* in between the subject and the modal or form in *do* (*He probably will/did not see her*). If modals and *do* remained in T and the subject was in Spec AGRsP, the adverb could adjoin to TP. Now

that T moves to AGRs, the adverb adjoins to an intermediate projection (AGRs'), not a desirable option. Adjunction to this intermediate level also must take place when an analysis with just one functional category is used. Thus, in this respect, there is no advantage to using two functional categories.

3. Kayne (1991) argues instead for the existence of a NumP to which the *wh*-element adjoins and then agrees with the Head through a special kind of Spec-Head agreement (the *wh*-element is not in Spec NumP!). In cases where agreement does not occur, the *wh*-element does not adjoin and moves to Spec CP directly.

VI

SEMANTICS AND COGNITIVE LINGUISTICS

HOW THE GOAL CAN BE THE SOURCE: THE SEMANTICS OF THE JAPANESE DATIVE MARKER *ni**

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1. INTRODUCTION. The Japanese dative marker *ni* has a surprisingly wide range of senses. In addition to the cross-linguistically prototypical Goal Sense, it can also encode the Source in sentences involving movement:

- (1)a. *Taroo-ga sen-getsu TOKYO-ni it-ta.*
Taro-NOM last-month TOKYO-DAT go-PAST
'Taro went to Tokyo last month.'
- b. *Taroo-ga HANAKO-ni hon-o kari-ta.*
Taro-NOM HANAKO-DAT book-ACC borrow-PAST
'Taro borrowed a book FROM HANAKO.'

1a above describes Taro's going to Tokyo, where the dative nominal *Tookyo* encodes the Goal to which the Subject Taro moves. In 1b the dative nominal encodes the Source, from which the Subject Taro borrowed a book.

The purpose of this paper is to examine the semantic structure of the dative marker in detail within the framework of Cognitive Grammar (Langacker 1987, 1991a, 1991b), thereby offering an explanation for the following enigma: how can the dative *ni* mark the two semantically disparate roles, the Goal and the Source?

The Goal and the Source are disparate because in terms of energy flow, the Source belongs to the UPSTREAM, whereas the Goal belongs to the DOWNSTREAM. See the Source-Path-Goal Image Schema in Figure 1. In the figure, rectangles (□) stand for a space and a circle with an arrow projecting from it (○→) for a mover.

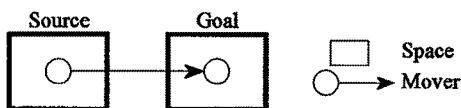


FIGURE 1

2. THE AGENTIVE-SOURCE SENSE. The Source Sense observed in 1b above is not a bona-fide Source, as it can not be a location. Observe the following pair of examples:

- (2)a. **Taroo-ga TOKYO-ni Oosaka-e hikkosi-ta.*
Taro-NOM TOKYO-DAT Osaka-to move-PAST
'Taro moved FROM TOKYO to Osaka.'
- b. *Taroo-ga TOKYO-KARA Oosaka-e hikkosi-ta.*
TOKYO-FROM
'Taro moved FROM TOKYO to Osaka.'

*I thank Ron Langacker, Yuki Kuroda, and Suzanne Kemmer for their helpful comments on earlier versions of this paper. I am also grateful to audiences at 1992 Cognitive Linguistics Workshop at Berkeley, where an earlier version of this paper was presented.

Abbreviations used in this paper are: NOM = nominative; ACC = accusative; DAT = dative; GEN = genitive; CAUS = causative; PASS = passive; GER = gerund; PERF = perfective; IMP = imperfective.

**This paper received the Presidents' Pre-Doctoral Commendation.

2a describes Taro's moving from Tokyo to Osaka, where the Source expression *Tookyoo* is marked by *ni*. The sentence, however, is ungrammatical and the postposition *kara* must be used in place of *ni*, as shown in 2b. This fact shows that *ni* can not encode a Source that is a location, and thus what seemed to be a Source in 1b is not a genuine Source.

Now the following question arises: if the Source Sense observed in 1b is not a bona-fide Source, exactly what role does *ni* encode in the sentence?

To answer this question, let us first examine the semantic structure illustrated in Figure 2 for sentences with a verb of GETTING, which include the dative nominal

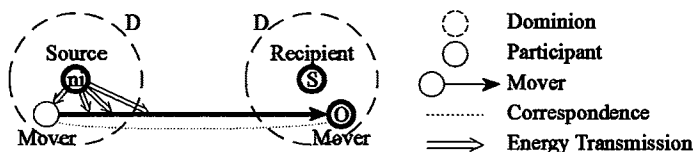


FIGURE 2

encoding the SOURCE Sense in question. On the left, there is the Source represented by a small circle (○) and on the right, the Recipient. The Source and Recipient each have a Dominion, or a sphere of influence, around it. In the figure the Dominions are represented by large broken-line circles (○) with the capital letter D. The Mover, represented by a small circle with an arrow projecting from it (○→), moves from within the Dominion of the Source into that of the Recipient. The dotted line (.....) connecting the two circles, one within the Dominion of the Source and another within that of the Recipient, indicates correspondence; that is, the two are not different entities, but two occurrences of the same entity, i.e. the Mover. The use of bold lines for the Source, Recipient, and Mover nominals and for the relation of movement indicates that they are profiled entities; i.e. substructures within the entire structure that are obligatorily accessed, accorded special prominence, and function as the focal points. In terms of grammatical relations, Recipient is the Subject and the Mover the Direct Object. In terms of case-marking, the Recipient is marked by the nominative *ga*, the Mover by the accusative *o*, and the Source by the dative *ni*. Note that the semantic role of the dative nominal is not only the Source, but also the Agent. The nominal directs energy toward the Mover to effect its movement. In the figure, this energy transmission is represented by double-line arrows (⇒). The semantic role of the dative nominal observed in (2) is, therefore, an Agentive Source, not a Locative Source. This Agentive-Source Sense of *ni* is illustrated in Figure 3.

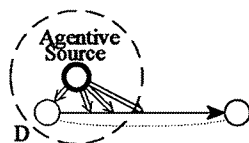


FIGURE 3

Evidence for the agentivity of the Source Sense comes from 3a-c below, all of which describe Taro's borrowing a book:

- (3)a. *Taroo-ga HANAKO-ni tegami-o morat-ta.*
 Taro-NOM HANAKO-DAT tegami-ACC get-PAST
 'Taro got a letter FROM HANAKO.'

- b. **Taroo-ga GAKKOO-NI tegami-o moratta.*
 SCHOOL-DAT
 'Taro got a letter FROM HIS SCHOOL.'
- c. *Taroo-ga GAKKOO-KARA tegami-o moratta.*
 SCHOOL-FROM
 'Taro got a letter FROM HIS SCHOOL.'

Compare grammatical 3a with ungrammatical 3b. The relevant difference between the two is that in 3a, the dative nominal *Hanako* is a human being, while in 3b the dative nominal *gakkoo* 'school' is a location. 3b is ungrammatical because the dative nominal *gakkoo* can not be construed as agentive, being a location. It must be paraphrased as 3c, where the dative marker is replaced by the postposition *kara* 'from'.

3. THE AGENT SENSE. The agentive aspect of the Source Sense was observed in §2 above. The agentivity of *ni* is more prevalent and is observed in the Passive construction, where *ni* marks the Agent:

- (4) *Taroo-ga HANAKO-NI nagur-are-ta.*
 Taro-NOM HANAKO-DAT hit-PASS-PAST
 'Taro was hit BY HANAKO.'

4 above describes Taro's getting hit by Hanako. The Patient *Taro* is marked by the nominative *ga*, and the Agent *Hanako* by the dative *ni*. This agentive Sense of *ni* is

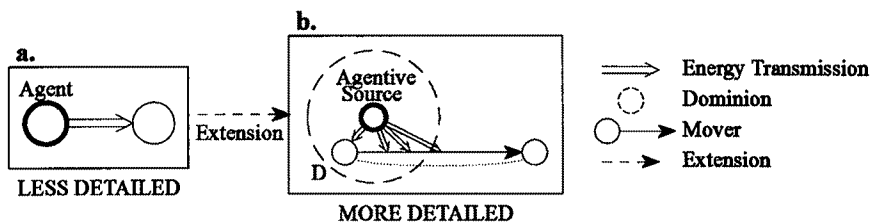


FIGURE 4

described in Figure 4a. The circle on the left represents an Agent, the double-line arrow ($\Rightarrow$) projecting from it energy transmission, and the circle on the right the Patient. Let us compare this Agent Sense with the Agentive-Source Sense observed in §2 above (Figure 3), which is repeated as Figure 4b. Notice that all the semantic specifications of the Agent Sense are present in the Agentive-Source Sense; the Agent, the Patient, and the energy transmission between the two Participants are all common to the two senses. The difference is that the Agentive-Source Sense is more detailed. That is, it has specifications as a Source; the Agent has a Dominion and the Patient doubles as a Mover. Notice that the Agent Sense is more basic and the Agentive-Source Sense is an EXTENSION from it.¹ In Figure 4, this relation of extension is represented by a dashed-line arrow ($--\Rightarrow$) connecting the two rectangular boxes.

¹The semantic relation in question is, technically speaking, that of SCHEMATICITY; the Agent Sense is schematic relative to the Agentive-Source Sense. This is so because there is no conflicting specifications between the Agent and Agentive-Source Sense. The relation is here described as that of EXTENSION, because the schematic relation is a special case of the extension relation.

4. THE RECIPIENT SENSE. Let us now GO DOWN THE STREAM and examine the Goal Sense in more details. Compare 1a (repeated below) with 5, which illustrates the RECIPIENT Sense:

- (1)a. *Taroo-ga sen-getsu TOKYOO-NI it-ta.*
 Taro-NOM last-month TOKYO-DAT go-PAST
 'Taro went to TOKYO last month.'
- (5) *Taroo-ga HANAKO-NI hana-o age-ta.*
 Taro-NOM HANAKO-DAT flower-ACC give-PAST
 'Taro gave flowers to HANAKO.'

The semantic structure for the Goal Sense is illustrated in Figure 5a and that for the Recipient Sense in Figure 5b. The two senses are similar in that they both describe

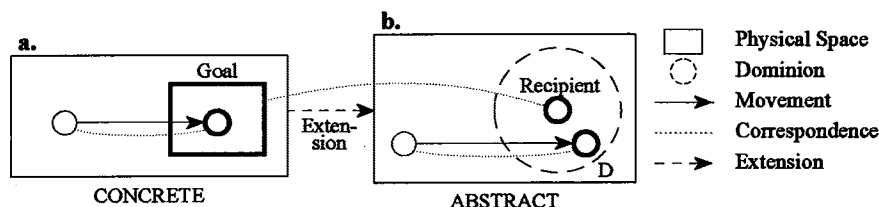


FIGURE 5

movement into some space. They are different, however, in some other respects. In the Goal Sense the dative nominal encodes a physical space—indicated by a rectangle in the figure—but prototypically a human being in the Recipient Sense. In the Recipient Sense, the dative nominal controls a Dominion, or a sphere of influence, being human. The Goal Sense involves movement into a physical space, whereas the Recipient Sense describes a change of ownership. That is to say, the Goal Sense is more CONCRETE, or the Recipient Sense is more ABSTRACT. Therefore, the Recipient Sense is an extension from the Goal Sense, which is symbolized in Figure 5 by the dashed-line arrow (— — ➔) connecting the two boxes.

5. THE REDUCED ENIGMA. In §2 what appeared to be a Source Sense was shown to be an Agentive-Source Sense. In §3 the Agentive-Source Sense was shown to be an extension from the Agent Sense (Agent — — ➔ Agentive-Source). In §4 the Recipient Sense was introduced as an extension from the Goal Sense (Goal — — ➔ Recipient). The enigma raised in §1 is thus reduced to the MISSING LINK between the Recipient Sense and the Agent Sense, as is summarized in 6.

- (6) Goal — — ➔ Recipient — ??? — Agent — — ➔ Agentive Source

6. THE CAUSEE SENSE. The missing link mentioned in §5 above is provided by the Causee Sense, which is illustrated by 7 below:

- (7) *Hanako-ga TAROO-NI hana-o kaw-ase-ta.*
 Hanako-NOM TARO-DAT flower-ACC buy-CAUS-PAST
 'Hanako made TARO buy the flower.'

7 describes Hanako's making Taro buy a flower, which involves three Participants: the Causer *Hanako*, the Causee *Taroo*, and the Patient *hana* 'flower'. In terms of

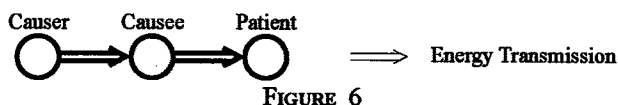


FIGURE 6

case-marking, the Causer is in the nominative, the Causee in the dative, and the Patient in the accusative. With respect to grammatical relations, the Causer is the Subject, the Causee the Indirect Object, and the Patient the Direct Object. There are two flows of energy involved here; the energy flows from the Causer to the Causee and from the Causee to the Patient, as is illustrated in Figure 6.

6.1. THE RECIPIENT --> THE CAUSEE. In order to see the semantic relation between the Recipient Sense and the Causee Sense, let us compare the semantic structure for the causative construction (given in Figure 7a), with that for the ditransitive construction (given in Figure 7b), which involves the Recipient Sense.² In the figure, double-line arrows ($\Rightarrow$) indicate energy transmission, dashed-line arrows ($-->$) experience, a single-line arrow ($\longrightarrow$) movement, and dotted-line arrows

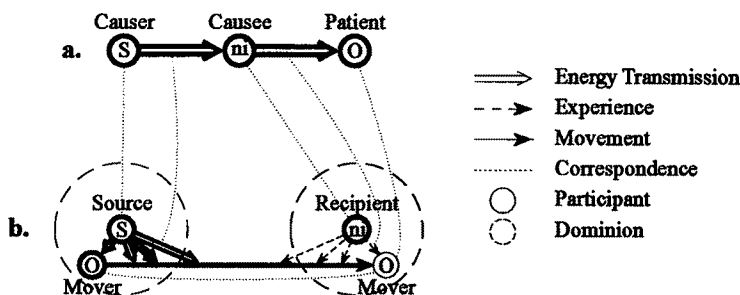


FIGURE 7

(.....) correspondence. The Recipient and the Causee are similar in terms of **AFFECTEDNESS** and **ACTIVENESS**. The Causee is affected because it receives the energy emitted by the Causer. The Recipient is also affected because the Mover moves into the Dominion of the Recipient, as the result of energy transmission to the Mover from the Source. In other words, the Recipient has undergone a change as is

²For a cross-linguistic discussion of the semantic structure of the causative construction in reference to the ditransitive construction, readers are referred to Kemmer & Verhagen to appear.

illustrated in Figure 8. At the stage described in Figure 8a, it is not in possession of

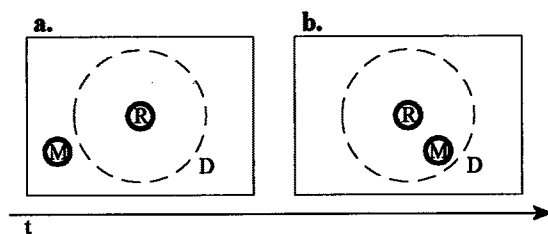


FIGURE 8

the Mover. At the following stage described in Figure 8b it is in possession. This commonality in terms of affectedness is illustrated in Figure 9. Figure 9b represents

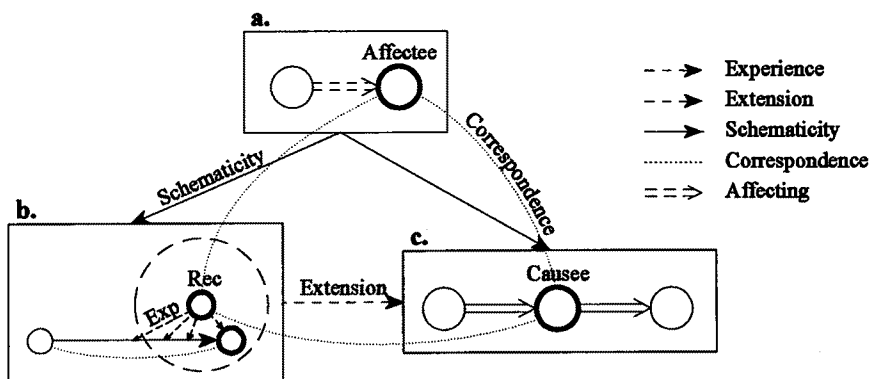


FIGURE 9

the Recipient Sense, and Figure 9c the Causee Sense. The dashed-line arrow ($--->$) connecting the two indicates that the Causee Sense is an extension from the Recipient Sense. Figure 9a is a schema which captures the commonality between the Recipient and the Causee Sense. It has two circles representing the Affector and Affectee and the double-dashed-line arrow ($==>$) connecting the two, which symbolizes the affecting. The solid-line arrows ($—>$) projecting from Figure 9a to Figures 9b and 9c symbolize the schematic relations the two pairs stand in. That is, the Affectedness Schema is schematic relative to the Recipient and the Causee Sense. The dotted lines ($.....$) indicate which participant the dative nominal corresponds to in each figure.

The Recipient and the Causee Sense are similar in terms of activeness as well. The Causee is an Agent because it transmits energy to the Patient.³ The Recipient, on the other hand, doubles as an Experiencer. Observe 8a–b:

- (8)a. *Taroo-ga HANAKO-NI titioya-no syasin-o mise-ta.*
 Taro-NOM HANAKO-DAT father-GEN photo-ACC show-PAST
 'Taro showed his father's photo to HANAKO.'

³A more detailed discussion of the agentivity of the Causee will be given in §6.2 below.

- b. *Hanako-ga TAROO-NI kekkon-suru koto-o hanasi-ta.*
 Hanako-NOM TARO-DAT marriage-do that-ACC speak-PAST
 'Hanako told TARO that she would get married.'

8a describes Taro's showing his father's photo to Hanako, and 8b Hanako's telling Taro about her marriage. The dative Participants in these sentences are Experiencers. When Taro showed his father's photo, Hanako must have SEEN the photo. Likewise, when Hanako told Taro about her marriage, Taro must have LISTENED to Hanako. Seeing and listening are acts of experience. In Figure 9b, dashed-line arrows extending from the Recipient to the Mover symbolize this relation of experience.

Now that we have seen the additional role of the Recipient as an Experiencer, let us compare the Agent and Experiencer. Langacker (1991b:327) suggests the ROLE ARCHETYPES as in Figure 10. The Agent and the Instrument belong to the

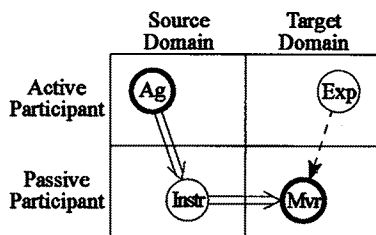


FIGURE 10

SOURCE domain. Within this domain, the Agent is the ACTIVE Participant and the Instrument is the PASSIVE Participant. The Experiencer and the Mover, on the other hand, belong to the TARGET domain. Within the Target domain, the Experiencer is the active Participant while the Mover is the passive Participant. The Agent and Experiencer are, therefore, similar in that they are both active Participants in their respective domains.

Furthermore, there are Recipients which double as Agents rather than as Experiencers. Consider 9:

- (9) *Taroo-ga HANAKO-NI raburetaa-o watasi-ta.*
 Taro-NOM HANAKO-DAT love.letter-ACC hand-PAST
 'Taro handed a love letter to HANAKO.'

9 describes Taro's handing a lover letter to Hanako. When he handed it to her, she must have held-out her hand and moved her fingers to get hold of the letter. These actions on the part of Hanako are agentive. This Agentive-Recipient Sense is

illustrated in Figure 11d. In the figure, the dashed-line arrows ($--\rightarrow$) standing for

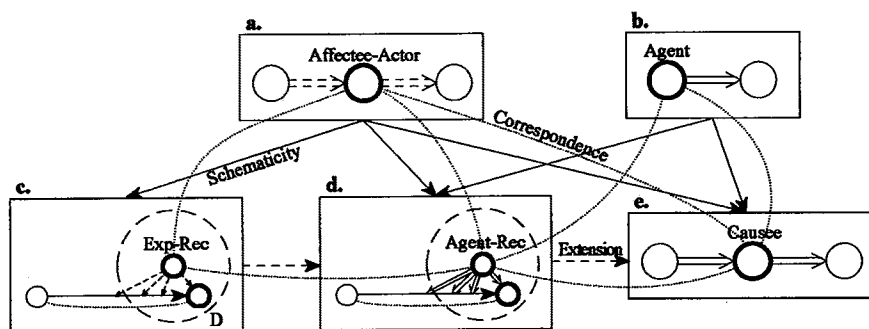


FIGURE 11

experience are replaced by double-line arrows ($\Rightarrow$) representing energy transmission. The dashed-line arrow ($--\rightarrow$) connecting Figure 11c—which specifically represents the Recipient Sense doubling as an Experiencer—and Figure 11d stands for the relation of extension holding between the two senses. That is, the Experiencer-Recipient Sense is more basic and the Agentive-Recipient Sense is an extension from it, which is natural considering that the latter is distributionally more restricted.

Furthermore, Figure 11 as a whole summarizes the commonality between the Recipient and the Causee Sense in terms of affectedness and activeness. In addition to the extension relation holding between the Experiencer-Recipient Sense (Figure 11c) and the Agentive-Recipient Sense (Figure 11d), it also shows that the Causee Sense (Figure 11e) is an extension from the Agentive-Recipient Sense (Experiencer Recipient $--\rightarrow$ Agentive Recipient $--\rightarrow$ Causee). Figure 11a is a schema which includes all the semantic specifications common to the three senses, but nothing else. The solid-line arrows ($\Rightarrow$) connecting Figure 11a and the three below it (Figures 11c–e) encode this relation of schematicity. The dashed-double-line arrows ($=\Rightarrow$) in Figure 11a are intended to capture the relations of affecting and activeness. The one on the left symbolizes the affectedness, or the fact that the Experience-Recipient, Agent-Recipient, and Causee are all affected. The one on the right represents the activeness, or the fact that the three Participants are active ones, doubling either as Experiencer or Agent as well. The dotted lines indicate which Participant the dative nominal corresponds to in each figure. Figure 11b is another schema, which encodes the commonality specifically shared by the Agentive Recipient and the Causee; i.e. agentivity.

6.2. THE CAUSEE $--\rightarrow$ THE AGENT. Now that we have seen that the Causee Sense is an extension from the Recipient Sense, the only connection left to make is the one between the Causee and the Agent Sense, as is summarized in 10:

- (10) Goal $--\rightarrow$ Recipient $--\rightarrow$ Causee $—?$ Agent $--\rightarrow$ Agentive Source

The connection between the two senses is the agentivity of the Causee with respect to the caused event. Consider 11a–b below, which illustrate the well-known semantic contrast between the *ni*- and the *o*-causative:

- (11)a. *Taro-ga waruguti-o it-te HANAKO-O nak-ase-ta.*
 Taro-NOM slander-ACC say-GER HANAKO-ACC cry-CAUS-PAST
 'Taro made Hanako cry by calling her names.'

- b. *Kantoku-ga kuraimakkusu-de zyoyuu-ni nak-ase-ta.*
 director-NOM climax-at ACTRESS-DAT cry-CAUS-PAST
 'The director made the actress cry at the climax.'

11a-b are causative sentences of which the caused events are intransitive. Notice that the Causee is marked by the accusative *o* in 11a, and by the dative *ni* in 11b. 11a describes Hanako's crying as an uncontrollable action on her part. 11b, on the other hand, describes intentional crying by the actress. That is, in terms of agentivity, the *o*-marked Causee does not encode agentivity, while the *ni*-marked Causee specifically encodes it.

When the caused event is transitive, the Causee is always marked by the dative *ni*, unlike 11a-b. The agentivity is, nonetheless, encoded by *ni*:

- (12)a. ?*Hanako-ga tatioya-ni sinzoo-hossa-de sin-ase-ta.*
 Hanako-NOM FATHER-DAT heart-attack-with die-CAUS-PAST
 'Hanako made HER FATHER die of a heart attack.'
 b. ?*Hanako-ga taroo-ni saifu-o nakus-ase-ta.*
 Hanako-NOM TARO-DAT wallet-ACC lose-CAUS-PAST
 'Hanako made TARO lose his wallet.'

12a-b describe losing and dying, respectively, which are uncontrollable events. Without any contextualization, the sentences are at best marginal. Only when one adds a context that would make natural the intentional controlling of the event by the Causee are the sentences read as acceptable. For example, 12a improves if Hanako persuaded her father to intentionally take a high-cholesterol diet, put himself under stressful situations, etc., so that he could die of heart attack and pay his huge debt with the insurance payment. These facts show the agentivity of the dative-marked Causee.

Therefore, the connection between the Causee and the Agent Sense is their agentivity. This fact is illustrated in Figure 12. Figure 12b represents the Causee Sense and Figure 12c the Agent Sense. Figure 12a is the Agent Schema, which expresses the similarity between the two senses in terms of agentivity.⁴

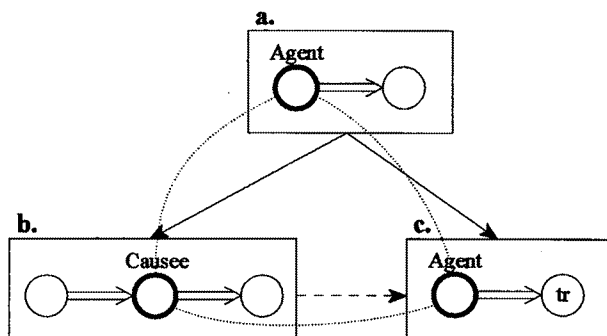


FIGURE 12

⁴Notice that Figure 12c is slightly made different from the Agentive Sense previously given in Figure 4a so that the difference between the Agent SCHEMA (Figure 12a) and the Agent SENSE (Figure 12c) is clear. The small circle on the right representing the Patient in Figure 12c has the designation *tr*, which is short for *TRAJECTOR*. The term is the Cognitive-Grammar equivalent of *SUBJECT* in the traditional sense. The designation is given to specify that the Patient Participant is the Subject of the overall clause; it is missing from the Agent Schema (Figure 12a) because in the Causee Sense, the Patient nominal is not the Subject.

7. THE EXPERIENCER SENSE. We saw in §6 above that the Causee Sense provides a link between the Recipient and the Agent Sense. There is another link, albeit an indirect one, between the two senses. Compare the Recipient Sense described in 5 (repeated below) with the POSSESSOR Sense described in 13 below:

- (5) *Taroo-ga HANAKO-ni hana-o age-ta.*
 Taro-NOM HANAKO-DAT flower-ACC give-PAST
 'Taro gave flowers to HANAKO.'
- (13) *Taroo-ni kodomo-ga san-nin i-ru.*
 Taro-DAT child-NOM three-person exist-PERF
 'Taro has three children.'

13 is not a transitive sentence, but an instance of the dative-Subject construction. The Subject nominal *Taroo*, which is the Possessor, is marked by the dative marker *ni*, and the Possessee is a non-Subject nominal marked by the nominative *ga*. The possession is expressed as the Possessee's existing within the Dominion of the Possessor, as is illustrated in Figure 13b. In the figure the small circle (○) in the

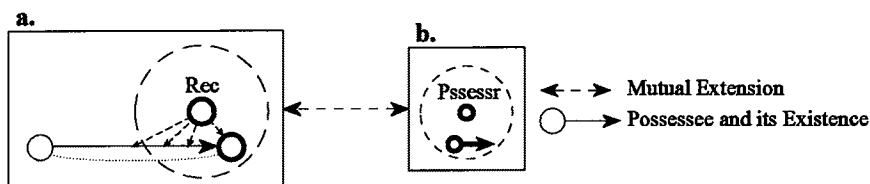


FIGURE 13

middle represents the Possessor, and the dashed-line circle (○) around it its Dominion. The little circle beneath it stands for the Possessee, and the solid-line (—→) projecting from the circle for the Possessee's existence. Compare this semantic description of the Possessor Sense with that of the Recipient Sense illustrated in Figure 13a. Notice that the semantic structure of the Possessor Sense corresponds to the final stage of or the stage resulting from the movement described in the Recipient Sense; the Possessee or the Mover resides within the Dominion of the Possessor or the Recipient. Even though it is clear that the Recipient and the Possessor Sense are closely related to each other, the directionality of the extension relation is not. I suggest that both senses are PROTOTYPES and that the relation between the two is a mutual extension, which is symbolized by a dashed-line double-headed arrow (← - →) in the figure.⁵

The Possessor Sense described above has a sense extended from it. Observe the EXPERIENCER Sense illustrated in 14 below:

- (14)a. *Taroo-ni hiruma-de-mo hosi-ga mie-ru.*
 Taro-DAT daytime-at-even star-NOM see-PERF
 'Taro can see the stars even during the daytime.'
- b. *Taroo-ni gengogaku-ga tumananai.*
 Taro-DAT linguistics-NOM boring
 'Linguistics is boring to Taro.'

14a describes the perceptual experience of seeing, and 14b the feeling of boredom. The dative Subjects in these sentences are not Possessors in any straightforward

⁵A PROTOTYPE is the standard in a categorizing relationship based on extension rather than schematicity.

sense; they are instead Experiencers. The Subject nominal experiences visual sensation in 14a and the emotion of boredom in 14b. This Experiencer Sense bears resemblance to the Possessor Sense, nonetheless, in that the type of experience undergone by the dative Subject is an internal one. The visual sensation and emotion can be construed as taking place internal to the Experiencer. Figure 14b

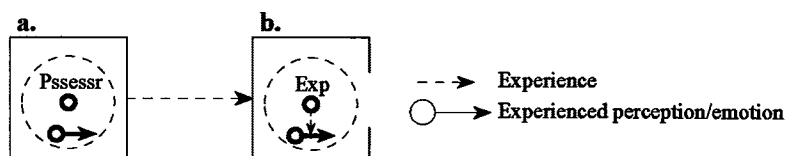


FIGURE 14

illustrates this Experiencer Sense. The small circle (○) in the middle represents the Experiencer, and the dashed-line arrow (--->) projecting from it experience. The small circle and the solid-line arrow (—>) projecting from it stands for the experienced perception or emotion. Figure 14a on the left describes the Possessor Sense discussed above and the dashed-line arrow (--->) connecting it to Figure 14b encodes the fact that the latter is an extension from the former.

The semantic extension from the Recipient Sense to the Possessor Sense to the Experiencer Sense is summarized in Figures 15b–d. The Experiencer Sense

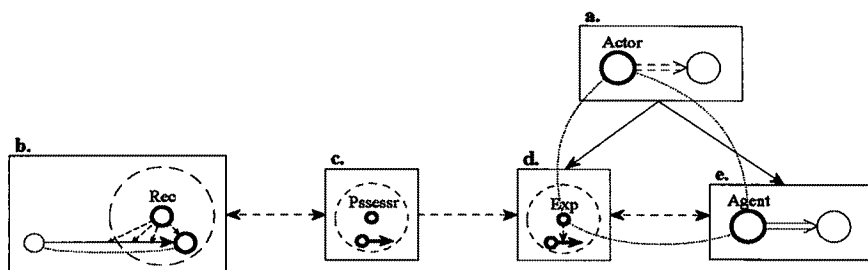


FIGURE 15

(Figure 15d), which is at the right end of the chain, is related to the Agent Sense (Figure 15e) in terms of activeness. Both the Experiencer and Agent are the active Participants. The Actor Schema in Figure 15a expresses this similarity in activeness. The dashed-line arrow connecting Figure 15d and Figure 15e symbolizes the fact that neither is more basic than the other. In sum, the Recipient Sense is related to the Agent Sense in another way via the intermediate senses of Possessor and Experience.

8. SUMMARY. This paper started with an enigma that how the dative marker can encode such disparate semantic roles as the Goal and Source. §2 identified what seemed to be the Source Sense as the Agentive-Source Sense. §3 showed that the Agentive-Source Sense is an extension from the Agent Sense (Agent ---> Agentive Source). In §4, the Recipient Sense was introduced as an extension from the Goal Sense (Goal ---> Recipient). The enigma was shown in §5 to reduce to the missing link between the Recipient and the Agent Sense, as was illustrated in 6 (repeated below):

(6) Goal ---> Recipient — ??? — Agent ---> Agentive Source

Sense and to the Agent Sense (Figures 17f-i). This chain extension is parallel

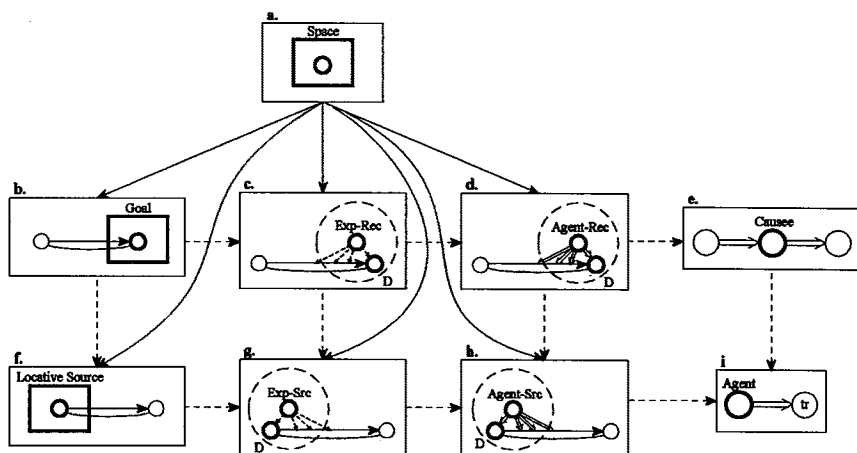


FIGURE 17

because the Locative-Source Sense (Figure 17f) is an extension from the Goal Sense (Figure 17b), the Experiencer-Source Sense (Figure 17g) from the Experiencer-Recipient Sense (Figure 17c), the Agentive-Source Sense (Figure 17h) from the Agentive-Recipient Sense (Figure 17d), and the Agent Sense (Figure 17i) from the Causee Sense (Figure 17e). This parallel extension is primarily motivated by the SPACE Schema (Figure 17a) which abstracts away from movement and characterizes the dative nominal as a space where the potential Mover resides.⁷

However, human languages often opt for irregularity and complexity over simplicity and elegance, and this seems to be an example of such a case. The above alternative analysis is simply wrong for empirical reasons; that is, the Locative Source Sense (Figure 17f) and the Experiencer-Source Sense (Figure 17g) cannot be encoded by the dative marker in Japanese:

- (2)a. **Taroo-ga TOKYO-NI Oosaka-e hikkosi-ta.*
Taro-NOM TOKYO-DAT Osaka-to move-PAST
'Taro moved FROM TOKYO to Osaka.'
- b. *Taroo-ga TOKYO-KARA Oosaka-e hikkosi-ta.*
TOKYO-FROM
'Taro moved FROM TOKYO to Osaka.'
- (17)a. **Taroo-ga HANAKO-NI kyookasyo-o tot-ta.*
Taro-NOM HANAKO-DAT textbook-ACC take-PAST
'Taro took a textbook FROM HANAKO.'
- b. *Taroo-ga HANAKO-KARA kyookasyo-o tot-ta.*
HANAKO-FROM
'Taro took a textbook FROM HANAKO.'

⁷Notice that this parallel extension motivated by the Space Schema does not apply to the extension from the Causee Sense to the Agent Sense. The extension is simply motivated by the Agentivity of the Causee and Agent.

abstract to be useful (Figure 18a). Let us extrapolate a little and consider the more

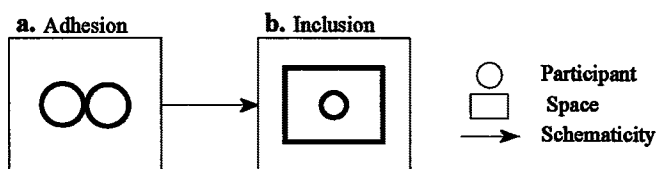


FIGURE 18

concrete notion of **INCLUSION**, which is to be considered a special case of the notion of contact. The Inclusion Schema (Figure 18b) consists of a Participant—indicated by a small circle (○) in the figure—located within the boundaries of some space, indicated by a surrounding rectangle (□). His analysis is able to nicely incorporate such senses of *ni* as the Goal, Recipient, Possessor, and Experiencer, semantic structures of which include a Participant located within the boundaries of some space, be it a physical space or a Dominion.

However, I see two kinds of problems with his analysis. One is the undergeneralization problem. The Causee and the Agent Sense can not be subsumed under the Inclusion Schema in any obvious way; the semantic structure of the two senses do not include a Participant located within the boundaries of some space. One can stretch the notion of inclusion or contact so that it can subsume the problematic cases. This would, however, make the schematic notion too schematic and devoid of any descriptively useful semantic content.

The other is the overgeneralization problem. The Locative-Source Sense and the Experiencer-Source Sense, both of which are not encoded by *ni*, cannot be excluded. In 2a and 17a (repeated below), the dative Participants can only be construed as a Locative Source and Experiencer Source, respectively, and the sentences are ungrammatical:

- (2)a. **Taroo-ga TOKYOO-NI Oosaka-e hikkosi-ta.*
 TARO-NOM TOKYO-DAT Osaka-to move-PAST
 'Taro moved FROM TOKYO to Osaka.'

- (17)a. **Taroo-ga HANAKO-NI kyookasyo-o tot-ta.*
 TARO-NOM HANAKO-DAT textbook-ACC take-PAST
 'Taro took a textbook FROM HANAKO.'

The Locative-Source and the Experiencer-Source Sense are, however, naturally subsumed under the Inclusion Schema. As is clear in Figure 19, the Locative-

Source Sense (Figure 19b) includes a Mover located within the boundaries of a Source, and the Experiencer-Source Sense (Figure 19) a Mover within a Dominion.

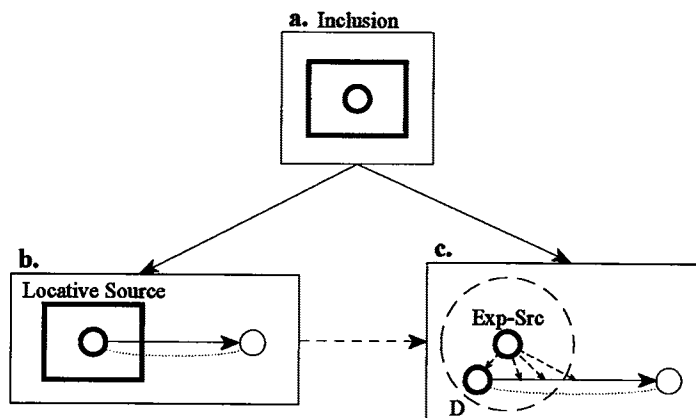


FIGURE 19

In the NETWORK-based approach (Lakoff 1987, Langacker 1987, 1988, 1991a, 1991b) adopted by my analysis, however, all the senses of *ni* naturally constitute a single category because of the semantic similarities observed at least between neighboring senses expressed by schemas, which enable semantic extensions (cf. 15 and Figure 16). The Causee and the Agent Sense are incorporated into the network because of its resemblance to the Agentive-Recipient Sense and the Experiencer Sense, respectively. The Locative-Source Sense and the Experiencer-Source Sense are excluded because they are not listed in the network.

The crucial difference here is the BOTTOM-UP conceptualization of categorization. In the network-based approach, all the concrete senses are included in grammar and form the basis of categories. The abstract schemas only EMERGE from the concrete senses, rather than the concrete senses being GENERATED from the abstract senses. This paper, therefore, provides support for the network-based approach to linguistic categorization.

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ON THE INSTRUMENTAL IN POLISH

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Polish nominals in the instrumental case are easy to recognize. The instrumental singular has the characteristic *-ą* ending in the feminine (*kulą, ławką*), and the *-em* ending in the masculine and neuter (*chłopcem, oknem*) while the instrumental plural is, as a rule, marked by the ending *-ami* (*kulami, chłopcami, oknami*) with a few deviations in *-mi* (*dłóhmi, końmi*) and some fossilized phrases in *-y* (*dawnymi czasy, tymi słowy, przed laty*).

In modern Polish the instrumental appears in its "synthetic" form or with prepositions, of which the preposition *z/ze* (= **with**) is most characteristic (*z Jankiem, ze złością*)¹. The instrumental in Polish constructions without a preposition, which are the only ones to be investigated in this paper, is considered as a deverbal case, i.e. a case of verb complements. It appears on nominals following verbs that govern the instrumental case (*pisać piórem* = *write with a pen*, *oddychać czystym powietrzem* = *breathe clean air-Instr.*), including the copula (*być/zostać nauczycielem* = *be/become a teacher-Instr.*). The only nominal phrases it occurs in as a modifier have deverbal head-nouns (*rzut oszczepem* = *a javelin throw*, *jazda pociągami* = *a train ride*). Very rarely, the instrumental is found on nouns following adjectives in adjective phrases such as *wielki duchem* (= *great in spirit-Instr.*)

Polish instrumental NP's have been traditionally assigned four syntactic functions in a sentence: the adverbial (examples 1-4, 9a, 10a, 10b, 11a, 12a, 13a, 13c, 14a, 15a, 16a), the direct object (5, 6, 7b), the "oblique" (i.e. any non-accusative/genitive) object (examples 8a, 8b), and the predicative (10c). (See Doroszewski 1980:374; Heinz 1965:106)

The various uses this case is put to are extremely diversified from the point of view of the meaning the instrumental signals in each use. The aim of this paper is to find out if the numerous semantic kinds of the Polish instrumental can be reduced to a few general types and to what extent a general semantic characteristic of this case as a more or less abstract indicator of the notion of the instrument can be maintained. The relationships between the instrumental and the locative and the instrumental and the nominative as well as that between the accusative-marked direct object and the instrumental-marked single complement of the same verb will also be examined. Consequently, 16 examples considered in this paper fall into two groups: the first group comprises a fairly representative, though by no means complete, list of different instrumental constructions in Polish (examples 1-10); the

second group represents sample pairs of contrastive examples with the same lexical verb followed by the accusative NP and the instrumental NP (examples 11-16).

Examples in 1 represent the classical use of the instrumental, the so-called *instrumentalis instrumenti*. The instrumental marked NP denotes an instrument or a tool the action is performed with.

- 1a. Jan kroi chleb **nożem**.
John is cutting bread **with a knife-Instr.**
- 1b. Jan leci **samolotem**.
John is flying **by plane-Instr.**

The knife in (1a) is a tool the agent uses to cut the bread, and the plane in (1b) is the instrument which allows the agent to engage in the activity of flying. One could say that in these examples the instrument accompanies the agent in the performance of the action. It is present in the event from its very beginning, and can be considered an indispensable element of the event, a sort of an "accessory" to the performed operation. We can observe that the instrument or tool are frequently highly predictable from the lexical meaning of the verb in constructions with the classical instrumental. One writes with a pen or pencil, cuts with a knife or scissors, sews with a needle, etc. The instrument involved in the event is most frequently an inanimate object, but it can be an animate being, as is the horse in (1c), or even a human being in Polish sentences with the verb *posyłać* (=send) and its derivatives, as illustrated by example (1d):

- 1c. Jan orze **koniem**.
John ploughs **with a horse-Instr.**
(= John uses a horse to pull the plough.)
- 1d. Jan wysłał jej kwiaty **posłańcem**.
John sent her flowers **by a delivery boy-Instr.**

Discussing examples of animate instruments in various languages, Kempf (1970:44) observes that their participation in the performed activity should naturally be more active than that of inanimate instruments. He also suggests that constructions with human instrumental agents, still quite common in Russian (*kniga napisannaja pisat'elem*) and in Czech (*kniha napsána spisovatelem* - Kempf 1970:95) reflect the "primitive perception of the world where man was regarded as an instrument of Nature, and not a free agent" (Kempf 1970:44). The Old Slavic construction with the human instrumental agent started disappearing from Polish already in the Middle Ages. It was first substituted by the ablative-like prepositional phrase with *od* + genitive (*księga napisana od pisarza*), and then by the prepositional phrase with *przez* used today (*przez pisarza*). The best known Polish example of the human instrumental agent comes from the first Polish national anthem "Bogurodzica" (13th century) and is given in (1e):

- 1e. "Bogurodzica dziewica, **Bogiem** sławiena Maryja"
"God's virgin mother, **by God-Instr.** praised Maria"
(*Bogurodzica*, 13th century)

All examples of the classical *instrumentalis instrumenti* given in 1 can be paraphrased with the help of the reflexive verb *posługiwać się* (= use). Topolińska, a Polish slavist currently working on the contrastive grammar of Polish and Macedonian, in her 1990 article on the instrumental in these two languages, interprets all classical instrumentals as derivatives from a causal compound *The agent uses a tool/an instrument in order to perform the action of...* (*Agent posługuje się narzędziem, aby.../ bo chce ...*) (Topolińska 1990:432). She suggests that since the classical instrumental structures are derivatives, they should not be considered basic for the other structures with the instrumental case. In her opinion, instrumental constructions illustrated in (2) provide the best diagnostic context for reconstructing the "primitive" (i.e. original and basic) function of the instrumental in Slavic (Topolińska 1990:431):

- 2a. Jan napełnia wiadro **wodą**.
John is filling the bucket **with water-Instr.**
- 2b. Ewa przykrywa garnek **pokrywką**.
Eve is covering the pot **with a lid-Instr.**

The instrumental-marked NP's in (2) can still be interpreted as instruments used by the agents in order to perform the actions of filling or covering. Sentences (2a) and (2b) differ from the classical instrumental examples in (1) in that they are paraphrasable by simple sentences with the accusative object and a locative phrase: *Jan umieszcza wodę w wiadrze* (=John is placing water in the bucket) for (2a) and *Ewa umieszcza/kładzie pokrywkę na garnku* (= Eve is putting/placing the lid on the pot) for (2b). This interesting interpretation of the original function of the instrumental emphasizes the proximity of the instrumental to the locative. We should notice that both the locative and the instrumental point to the parameters inherently present in any event: location in space (and in time) (compare the concept of "setting" in diagrams of case uses proposed by cognitivists - see e.g. Rudzka-Ostyn 1992) and instrument interpreted as a possible "accessory" of any activity. Viewed as an element present in an event from the beginning, the notion of instrument is similar to the notion of *locus*. This similarity would explain the use of the instrumental case in structures with an instrumental adverbial of place, such as those in (3), traditionally referred to as *instrumentalis loci*:

- 3a. "Idzie żołnierz **borem, lasem...**" (a popular soldier's song)
"Is going a soldier **through the wood and forest**"-Instr.
- 3b. "Harcerz **drogą** maszerował..." (a popular scout's song)
"A scout was marching **along the road**"-Instr.
- 3c. Ukochane potrawy mojej żony wychodzą mi **bokiem/nosem**.
My wife's favourite dishes are coming out **through my side/nose**-Instr. (an idiomatic expression: =I have had enough of my wife's cooking).

Only some lexical verbs in Polish can be followed by the instrumental of place. According to Kempf (1970:87) this structure is limited to predicates with lexical verbs expressing a progressive movement "with no indication of direction, beginning or end", as in (3a) and (3b), (*gressivus* in his terminology), and to those

with verbs indicating movement through an obstacle, as in example(3c)(Kempf's *transgressivus*; Jakobson 1936/1971 refers to this class of instrumentals in Russian as instrumentals *den Bewegungsraum*). The range of use of the instrumental *loci* has shrunk greatly in Modern Polish, but the structure can still be found in expressions such as *płynąć morzem*, *Wiśłą*= go by sea, along the river Vistula; *jechać drogą, polem* = take the road, go across the fields, etc.

- 4a. Lubię podróżować **nocą**.
I like travelling **by night-Instr.**
4b. Lubię podróżować **w nocy**.
I like travelling **at night-Loc.**

The possibility of the instrumental of time (*instrumentalis temporaris*), illustrated in (4), is entailed by the existence of the instrumental *loci*, as the instrumental of time denotes nothing else but a place of the event in time. In his grammar of Polish, Szober (1953:358,360) suggests that the semantic difference between sentences with the instrumental of time, such as *nocą* (= *by night*) of example(4a), and their paraphrases with the locative, such as the paraphrase given in (4b) with the prepositional phrase *w nocy* (= *at night*) concerns two different perceptions of time: when the locative is used, time is perceived in its totality, and with the use of the instrumental, its partial view is implied. This difference is hard for me to see. My intuition is that in the locative expression *w nocy*(= *at night*) the time of the event is perceived globally as a static entity while the instrumental case *nocą* (= *by night*) requires a dynamic interpretation of time in progress. To me, sentence (4b) means: *I like travelling as night progresses*. Needless to say, semantic differences between the locative and the instrumental need further investigation.

5. Prezydent rządził **krajem**.
The president ruled **the country-Instr.**
6. Ewa wzgardziła **Piotrem**.
Eve rejected **Peter-Instr.**(thus showing her contempt for him)

Examples (5) and (6) differ from all the other instrumental structures considered here in that they can have passive equivalents, with the original instrumental NP's changed into the nominative marked subjects. One can say: *Kraj jest rządzony przez Prezydenta*(= *The country is ruled by the Prezydent*) and *Piotr został wzgardzony przez Ewę* (= *Peter was rejected by Eve out of contempt*), a syntactic possibility which suggested to some Polish linguists (see Heinz 1965:106) that the instrumental NP's here should be treated as an ordinary direct object, the function characterizing the accusative-genitive marked Polish nominals. Even though the Passive test does seem to work with verbs that enter this instrumental structure, the Negation test by virtue of which bona fide direct objects assume the genitive case marking in negative sentences, does not apply here. While the accusative NP object in (7a): *Jan kupił fabrykę* (*John has bought a factory-Acc.*) turns into the genitive when the predicate is negated (*Jan nie kupił fabryki*= *John did not buy a factory-Gen.*), the instrumental NP complement in (7b)(*fabryką*) retains the instrumental case in the sentence's negative equivalent.²

- 7a. Jan kupił **fabrykę**. Jan nie kupił **fabryki**.
 John bought a **factory**-Acc. John did not buy a **factory**-Gen.
 7b. Jan kieruje **fabryką**. Jan nie kieruje **fabryką**.
 John manages a **factory**-Instr. John doesn't manage a **factory**-Instr.

It should be observed that the lexical meaning of all verbs used in the instrumental structure illustrated by examples in (5), (6) and (7b) (*rządzić*=rule; *dyrygować*, *zarządzać*, *kierować*=manage, lead; *trząść*=exercise one's power over, etc.) is characterized by the notion of "being in power and having control", a semantic factor which finds a morphological-syntactic reflection in the presence of the instrumental case on the NP's governed by these verbs. In the classical instrumental cases (examples in 1) the instrument denoted by the instrumental NP is frequently highly predictable being determined by the lexical meaning of the governing verb; in the instrumental structures with the verbs of power, predictions as to what elements are going to be governed, controlled or detested are much harder to make. It seems to me that the instrumental in this structure is chosen in order to show that even though not easily predictable from the lexical meaning of the governing verbs (and in that similar to entities denoted by the accusative direct objects) the animate or inanimate objects marked by this case remain in the **sphere of total control** of the subject agents. This interpretation of the instrumental case as a sign of subordination and being under control agrees with the explanation that the instrumental structure with *gardzić* (= *detest*), (example 6), which is found in almost all Slavic languages as well as in OCS (Topolińska 1990:432), denotes "a degradation of a human being to the position (and function) of a material inanimate object". Viewing the instrumental as a sign of the object's inferior state of total submission and controllability will gain additional support from the paraphrase of this instrumental construction with the verbs *rozporządzać* (= *to have at one's command*), *dysonować* (= *have at one's disposal*) proposed by Topolińska (1990:431) for Polish and Macedonian. Since the paraphrase *może dokonywać dowolnych operacji na...* (= *can perform any operations on...*) is possible here, argues Topolińska, the "object is presented not as a goal of a definite operation but as being - totally and uniquely - within the scope of the activity of the agent." It should be observed that the paraphrase suggested by Topolińska again includes a locative phrase; it does not, however, apply to the examples with *detest*. In his "Grammaire comparée des langues slaves" Vaillant (1977:98) proposes a locative interpretation of the instrumental NP's under discussion. In this interpretation, example(5) (*The President ruled the country*-Instr.) would be equivalent to *The President ruled in the country*-Loc.

- 8a. Jan opiekuje się **siostrą**.
 John takes care-Reflexive of **his sister**-Instr.
 8b. Jan interesuje się **muzyką**.
 John is interested-Reflexive **in music**-Instr.

The instrumental type represented by examples (8a) and (b) appears in sentences with reflexive verbs. The instrumental NP's here do not denote instruments used by the agent to perform the activity but indicate the agent's action's patients. The paraphrase with *posługiwać się* (=use) is impossible here. Since the accusative case is already present in these sentences in the obligatory reflexive pronoun *się*, which therefore fulfills the function of the sentence's formal direct object, the instrumental is used in its place on NP's denoting the real object of the activity performed by the agent. The instrumental in constructions with reflexive verbs serves as a substitute for the accusative case, and the instrumental NP's here are in fact what Topolińska (1990:432) calls "demoted" accusative NP's³. Commenting on Topolińska's generalization, we should observe, however, that sentences represented by example (8b) (with reflexive verbs such as *zajmować się* = *occupy oneself with*; *przejmować się*, *martwić się* = *worry*; *cieszyć się* = *be happy about*, etc.) can have active voice paraphrases with the original instrumental NP "promoted" to the nominative subject position, as in *Muzyka interesuje Jana* (= *Music-Nom. interests John-Acc.*). This possibility would suggest that the instrumental NP's in sentences with reflexive verbs where such paraphrase is possible are different from other instrumental NP's in reflexive structures for they can be interpreted as causal agents (*instrumentalis causae*).

The instrumental NP's in a group of Polish passive constructions, represented by example (9a), denote inanimate agents. In the active voice equivalents of these constructions (9b) the agent NP appears in the nominative marked position of the subject which would confirm a possible description of these instrumentals as "demoted" nominative agents. Their role is somewhat similar to the role of the instrumental agent in examples such as (1e), but this instrumental type is restricted to inanimate NP's which cannot always be treated as the sole factors responsible for bringing the event about⁴.

9a. Silnik poruszany jest **prądem elektrycznym**.

The engine is moved **by electricity-Instr.**

9b. **Prąd elektryczny** porusza ten silnik.

Electricity-Nom. moves the engine.

Instrumentals illustrated by examples in (10) represent the so-called *instrumentalis modi* (the instrumental of manner), which, according to Vaillant (1977:93), includes also the instrumental in predicative nominals. As this last instrumental type is the subject of another paper (Bacz 1992), I am only mentioning it here. Of relevance to the present discussion, however, is the fact that a paraphrase with the instrumental of manner NP promoted to the nominative agent position is possible for many manifestations of this instrumental. A working hypothesis that the *instrumentalis modi* is closely linked to the event's agent (as a "demoted" nominative or an accompanying factor) should be tested on a larger body of data.

10a. Wyjechali za granicę **całą rodziną**.

They went abroad, **the family as a whole-Instr.**

(cf. **Cała rodzina** wyjechała za granicę.

The whole family-Nom. went abroad.)

10b. **Myślami** jestem z tobą.

Through my thoughts-Instr., I am with you.

(cf. **Moje myśli są** z tobą.

My thoughts-Nom. are with you.)

10c. Jan jest **inżynierem**.

John is **an engineer-Instr.**

An interesting group of instrumentals with the instrumental NP's denoting a body part or an object which could be regarded as a natural extension of a body part (an article worn or held in a body part) is represented by examples in (11). Body parts, which are inalienable possessions of the human agent, are in the agent's full control. The instrumental case signals this controllability at the same time indicating that the instrumental NP's remain within the agent's sphere of control as natural instruments his body is equipped with to perform various operations, most of which involve some sort of movement. Body part instruments are again highly predictable from the lexical meaning of the verb their instrumental NP's are governed by. Many verbs used in this construction are transitive, and the comparison between the instrumental and the accusative constructions they can appear in is most instructive.

11a. **Sciśnij to palcami**.

Squeeze it **with your fingers-Instr.**

11b. **Sciśnij moje palce**.

Squeeze **my fingers-Acc.**

12a. Jan kopnął **piłkę lewą nogą**.

John kicked the ball **with his left foot-Instr.**

12b. Jan kopnął **nogę** stołu.

John kicked **the leg-Acc.** of the table.

In examples (11a) and (12a) the instrumental NP's denote the fingers and the leg of the sentence's agents. The corresponding accusative NP's in examples (11b) and (12b) denote objects that do not belong to the agents in these structures (another person's fingers in (11a) and a table leg in (12b)), are not predictable and remain outside the agents' sphere of control. The accusative case is used here to indicate that the NP designates an object the activity is aimed at and/or affects, i.e. the true direct object patient in the event. The instrumental points to the instrument the activity is performed with, indicating that this instrument is always seen as remaining (directly or indirectly) in the agent's sphere of control.

In some verb-NP combinations, e.g. with the verbs *ruszać* (= move) or *trząść* (= shake) and the noun *ręka* (= hand) three semantic possibilities can be expressed with the help of the instrumental and the accusative cases. This situation is illustrated by the series in example (13):

13a. **Porusz ręką**.

Shake **your hand-Instr.** (to make a sign)

13b. **Porusz moją rękę**.

Move **my hand-Acc.** (i.e. take it and displace it)

13c. Porusz **moją ręką**.Move **my hand-Instr.** (to make a sign; make a sign with my hand)

Some linguists (see, e.g., Dąbrowska-Michalczak 1992:18) refer to the instrumental marked NP's illustrated by sentences (14a), (15a) as the "instrumental objects" to contrast them with the "accusative objects" that can follow the same (or very similar - see Bacz 1993) lexical verbs and are represented here by examples (14b), and (15b). This terminology is highly misleading. Even if the instrumental NP is the only possible complement these verbs can have in a given context, it will still denote only the instrument, participating in the performance of the operation and closely controlled by the agent. The accusative points to the object affected by the action. In example (14a) the dancer's hips are not seen as affected by the action of turning; they are only manipulated by the agent so that the turning movement could be performed. In example (14b) the dancer's neck is affected permanently: it is broken, or using the literal translation to render the image implied by the Polish expression: "it turned broken."

14a. Tancerka kręci **biodrami**.The dancer is turning **her hips-Instr.**14b. Tancerz skrzył **kark**.The dancer broke **his neck-Intr.** (He "turned it broken")

Of the semantic differences that can be detected between the instrumental and the accusative marked NP's following the same verb the difference concerning the orientation of the movement in examples involving verbs of movement is perhaps the most obvious: the instrumental prefers predicates expressing non-directed movement; the accusative favours constructions with predicates that express a clearly specified direction (See the discussion of the instrumental loci above). The metaphorical mental movement evoked by the verb *kierować* (= *guide*) in example (15a) does not imply any particular direction; in example (15b) with the same lexical verb followed by the accusative NP, the direction of the movement is clearly indicated by the prepositional phrase **na północ** (= **north**):

15a. Nieczne pobudki kierowały **jego postępowaniem**.Some dishonest reasons provoked (= guided) **his conduct-Instr.**15b. Znaki kierowały **nas na północ**.The signs led (=guided) **us-Acc. north**.

In the light of the foregoing discussion the semantic difference between two puzzling constructions with the verb *rzucić* (= *throw*) illustrated by the pair of sentences in example 16 should not be difficult to explain.

16a. Chłopiec rzucił (we mnie) **kamieniem**.The boy threw **the stone-Instr.** (at me).16b. Chłopiec rzucił **kamień** (do jeziora).The boy threw **the stone-Acc.** (into the lake).

In example 16a, with the instrumental, the noun *kamień* (= *stone*) denotes the instrument the agent (the boy) uses to perform the action of throwing with the intention of hitting a goal (me). The stone remains in the agent's perfect control for it is held by the agent in his hand when the throwing is about to be performed,

and it can be interpreted as a natural extension of this part of the agent's body. The direction of the throwing movement is not important for the speaker (though the goal of the action is), nor is the fact that the stone has been displaced in the operation. The accusative marked NP *kamień* (16b), however, denotes the patient of the operation of throwing. The speaker wants to tell us what happened to the stone; how it was affected by the operation. Its location changed as it was thrown into the lake. The direction of the movement is always clear in the speaker's mind (cf. the optional locative phrase with the preposition *do* (=to)).

Recapitulating the remarks made in this paper on the nature of the Polish instrumental we can conclude the following: 1. The instrumental case is used in its own right or as a substitute for the accusative in constructions with reflexive verbs ("demoted" accusative). 2. It indicates an object (inanimate or animate) which accompanies the agent in the performance of the activity, so it is necessarily present in the event from its beginning. (In this respect, the instrumental is close to the locative.) 3. Even though the object denoted by the instrumental participates in the performance of the activity, its position is inferior to the position of the nominative marked agent; the instrumental denotes an object which remains in the sphere of control of the agent ("demoted" nominative). To the extent that these characteristics can be accepted as defining in the concept of instrument, the general "instrument" meaning of the instrumental case can be maintained for Polish.

NOTES

1. Topolińska 1990:436 seems to have ignored Polish prepositional phrases with the genitive, such as *ze szkoły* (=from the school), *z domu* (=from the house) when she described the preposition *z/ze* as "reserved exclusively" for the instrumental prepositional phrases.

2. Heinz (1965:106) argues that the instrumental NP's in this structure function as direct objects because in many cases one can add to them, "even though only theoretically", another instrumental NP that indicates the true instrument. His example *kierować statkiem* (= lead, direct the ship-Instr.; cf. Latin *regere navem*-Acc.), has the passive equivalent *Statek jest kierowany* (= the ship-Nom. is led, directed) and admits of another instrumental NP *kierować statkiem sterem* (= to direct/lead/steer the ship-Instr. with a steering wheel-Instr.; cf. Latin *regere navem gubernaculo*). I find his example with the two instrumentals difficult to accept, perhaps because its semantic equivalent with a prepositional phrase *kierować statkiem przy pomocy steru* (= to direct the ship with the help of the steering wheel) is much more natural.

3. It should be observed here that the dative and the genitive are also used as such "demoted" ("oblique"?) objects in Polish with reflexive verb predicates (*przeglądać się komuś*-Dat.; *bać się kogoś*-Gen.).

4. Topolińska (1990:433) argues for the "demoted object" interpretation of these constructions saying that "the very fact that the accusative object is by

definition excluded from the so-called passive construction corroborates our hypothesis of the instrumental as a secondary, demoted object".

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THE CONTRASTIVE AND THE JAPANESE PARTICLE WA

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0. INTRODUCTION. Kuno(1973 and elsewhere) classifies the function of *wa* as thematic and contrastive. However, although 'contrastive' is the notion which has often been used in literatures, its exact nature is seldom defined. The contrastive has been rather a vague notion based on our intuitive reading of data. The objective of this paper is to clarify the nature of contrastive in terms of *wa* sentences. Instead of taking the position that there exists a dichotomy between contrastive and thematic, this paper argues that the contrastive reading of a *wa* sentence is the product of both the semantic property of NP-*wa* and the contextual environment, and views the contrastive effect as the matter of gradation.

1. CONTRASTIVE WA. *Wa* sentences¹ in (1) are typical examples of the contrastive case:

- (1) Ani wa hutuu no kaisyain daga/keredomo/noni
older brother ordinary company employee but
ototo wa yuumeina komedian da.
younger brother famous comedian

'The older brother is an ordinary company employee but the younger brother is a famous comedian.'

One might say, however, that the contrastive reading results from the context. It is true that many sentences like those in (1) in isolation do not necessarily have a contrastive implication as in (2); in Kuno's words, they are "ambiguous" between thematic and contrastive.

- (2) a. Ani wa kaisyain da.
'The older brother is an ordinary company employee.'
b. Ototo wa komedian da.
'The younger brother is a famous comedian.'

If it is the case that it is the context provides the contrastive effect, there is no such a thing as contrastive *wa*. In fact, Kuno's unambiguously thematic sentence, i.e., a generic statement (3), can be contrastive as well in the environment (4):

- (3) Kuzira wa honyuurui da.
whale mammal
'A whale is a mammal.'
(4) a. Kuzira wa honyuurui da ga same wa gyorui da.
but shark fish
'A whale is a mammal but a shark is a fish.'

¹ This paper does not follow the customary practice of using "speaking of" or "as for" as a translation of *wa*, unless it is necessarily.

However, it not so clear as it appears that the context is solely responsible for the contrastive effect in examples such as (1) and (4). Observe (5) and (6)

- (5) a. Tsuki ga deteiru.
 moon is-there
 'There is a moon (in the sky).'
- b. Ame ga hutteiru.
 rain is-falling
 'It is raining'
- (6) a. Tsuki ga deteiru ga/keredomo/noni ame ga hutteiru.
 but
 'There is a moon in the sky but it is raining.'
- b. Tsuki wa deteiru ga/keredomo/noni ame ga hutteiru.
 c. Tsuki ga deteiru ga/keredomo/noni ame wa hutteiru.
 d. Tsuki wa deteiru ga/keredomo/noni ame wa hutteiru.

Wa's in the sentences in (6) are all contrastive. According to Kuno, themes are generic or anaphoric. Once *ga* is replaced with *wa* in (6a), they are nothing but contrastive since *tsuki* and *ame* are neither generic nor anaphoric.

Suppose (6) provides the combination patterns of sentences, a paradigm(7) is assumed for (1) and (3).

- (7) a. *wa-wa* [thematic-thematic]
 b. *wa-wa* [contrastive-thematic]
 c. *wa-wa* [thematic-contrastive]
 d. *wa-wa* [contrastive-contrastive]

If we take Kuno's dichotomy of thematic -contrastive, sentence (4) is a case of (7a) and the contrastive readings in (7b-d) are given by the context. Then, it is not clear what is the difference between contrastive *wa* such as (9) and thematic *wa* such as (8) to which contrast is given by context.

- (8) A: Umi ni iru mono de hire ga aru toittara
 ocean inhabit thing and fin have if-you-say
 sakana ni kimatteiru zyanaika.
 fish must-be
 'If it inhabits the ocean and has fins, it must be a fish.'
- B: Sooto wa kagiranaisa. Kuzira *wa* honyuurui da yo.
 so is-not-always
 'Not necessarily so. A whale is a mammal, you know.'
- (9) A: Dare ga kinoo no atsumari ni kiteita?
 who yesterday's meeting came
 'Who came to yesterday's meeting?'
- B: Eetoo, Hayasi *wa* itanaa. Demo, ato wa siranai hito
 well was but the rest unknown people
 bakaridatta yo. (=Hayasi *wa* itta kedo ato wa shiranai.)
 only you know
 'Let me see. Hayasi was there. But I did not know any of the others.'

Furthermore, it is not clear what is the difference between the obligatory contrastive *wa* (context-free) in (6) and the optional ones (context-dependent), either.

Dretske (1972) defines a contrastive statement as a statement with a contrastive focus *U* and claims that the contrastive features of an utterance are pragmatic features which create the semantic differences between *C(U)* and *C(U')* when *U* and *U'* are embedded. If we take this position, in the case of (7d), two focal points, the *Np*'s followed by *wa* was structurally contrast each other. In the case of one focal point, the contrastive counterpart will be given by context² as in (9) and (10).

- (10) *Katyou wa minna to nominiitteru yo.*
section chief everybody with went-out-for-drink
Aa, demo katyou-hosa wa inokori kana.
oh but assistant section chief stay I-think
 'The section chief went out for drink with others. Oh, but
 the assistant section chief is staying (in the office), I think.

Maintaining the position that *wa* as a focal point marker, the following argues why in some cases the contrastive is obvious, while in others it is not so strong.

2. DEFINITENESS EFFECT. Japanese does not have (in)definite articles, but there is a certain correlation between the use of *wa* and that of English articles as in (11):

- (11) a. The man is swimming in the river.
 a'. *Otoko wa/ga kawa de oyoideiru.*
 man river in is-swimming
 b. A man is swimming in the river.
 b'. *Otoko wa*/ga kawa de oyoideiru.*

A *man* in (11b) can not be translated into Japanese with *wa*.

There are some linguistic phenomena where the distinction between definite and indefinite plays a key role. This has been called the "definiteness effect" or "definiteness restriction". A typical example of the definiteness effect is observed in the existential *there* sentence (12) in English.

- (12) a. There is a table in this room.
 b*. There is the table in this room.

Only the indefinite NP is allowed in this construction. Gil (1987) claims, beyond the existence (or non-existence) of morphological marking devices, the notion of (in)definiteness comes into play in many languages, if not at all, in the form of various definiteness effects.

Let us look at Japanese cases. Sentence (13) is a modern version of the opening sentence of *Ise-monogatari*, *The Tale of Ise* (the mid 10th century).

² "Context" includes here not only the specific discourse context, but also world knowledge.

- (13) Mukasi, otoko ga/wa* ita.
 in the past man was
 'Once upon a time there was a man.'

The opening sentence of a story has to be a *ga* sentence; but even in other environments, the sentence is not grammatical with *wa* just like (11b') is not. If the non-contrastive reading is given to a sentence like (13), *otoko* has to be interpreted as "the man", not "a man", and the sentence is no longer an existential sentence as we can see in (14).

- (14) Mukasi kono syokuba ni otoko wa ita.
 in the past this section in man was
 'A long time ago, the/*a man was in this section.'

On the other hand, with the plural interpretation of *otoko*, the sentence is contrastive and it is not a Japanese equivalent of the *there* existential sentence³(15a) but a non-existential sentence⁴(15b) for the reason discussed in the next section.

- (15) a. 'A long time ago, there were (some) men (but not
 women
 b. 'A long time ago, some men were in this section (but not
 women '

3. INDEFINITE NP AND WA. According to Milsark(1974 and 1977), the definiteness restriction on the *there* sentence has been defined too narrowly; the NP's which are excluded from this environment are not only "the+Np" but also a group of NP's which he called "strong" Np's. He claims that the weak/strong distinction as in (16) actually plays a role in "definiteness restriction" of *there* sentences.

- (16) Weak: *a/an* ; *sm*(vs.*some* in strong); number determiners;
 plural and mass *0* determiner in nonuniversal
 reading
 Strong: overt universal quantification -- *each, every, all* and
 any ; covert universals -- various definite
 determiners, *the*, demonstratives, etc., and the
 universal reading of the mass/plural *0* determiner;
 the quantifier *most* ; *some* (vs. *sm*), *many* (vs. *mny*)
 and the analogous readings of *lots of, few, plenty*,
 etc. [Milsark, 1977: 8 and 21]

He identifies the "weak" Np's, which are allowed only in a *there* existential sentence, as expressions of cardinality, and the "strong" NP's, which require a property reading on the predicate, as expressions of quantification⁵. In (16), words like *some, many*, and *few* and their analogous expressions can have either a cardinal reading(weak) or a quantified reading(strong). For example, the strong sense of *some salesmen* is very nearly synonymous with the partitive, *some of the*

³ Cf. Kuno(1971 and 1973) for a Japanese existential sentence.

⁴ Existential sentences are different from existential statements.

⁵ Cf. *the* as an expression of universal quantification in Chomsky (1975)

salesmen. In the partitive construction, it is generally agreed that [determiner-of-Np]: i) the NP has to be definite; ii) a set of the NP is contextually indicated(for the formal semantic characteristics of the partitive construction, cf. Ladusaw(1982)).

Kuroda(1965) also claims to give the quantificational reading to determiners in connection with *wa*. Adapting the framework of Brentano-Marty's theory of judgement, Kuroda identifies Japanese *wa* sentences with categorical judgment, which has a logical premise⁶ and conclusion type structure as illustrated by the interpretation (17b) of the *wa* sentence (17a).

(17) a. *Otoko wa kawa de oyoideiru.*

'The man is swimming in the river.'

b. If it is the man, then he is swimming in the river.

By the nature of categorical judgement, where a property reading on the predicate is requested, the "subject" of the predication sentence cannot be indefinite specific. For example, sentence(18a) is grammatical with non-specific reading of "a man", but (18b) semantically does not allowed non-specific reading, and is ungrammatical with the specific reading.

(18) a. A man is a mortal.

b*. A man is intelligent.

This explains the reason why *wa* cannot be used in (11b') and (13); *otoko* can not be non-specific in these sentences. Furthermore, besides indefinite non-specific nouns, Kuroda argues that determiners like "every", "some" (not as a plural form of the specific indefinite article *a*), or "any" with modifying nouns may act just like the non-specific case of "a man". That is, "Nouns that behave like a logical variables called indeterminate. The range of an (indeterminate) noun as a logical variable is specified by a modifier of the noun(Kuroda, 1965: 43)" as "in this room" does in his example(19).

(19) Every man in this room speaks English.

Thus, determiners with noun phrases are not excluded from subject of the predication judgment just as a non-specific indefinite noun like "a man" does not.

If it is the case that an indefinite noun followed by *wa* is an expression of quantification as Kuroda claims, and if Milsark's weak/strong or cardinal/quantifier distinction is the right characterization of the "definiteness" effect, then (14) is not (15a) but (15b) and this strong reading has something to do with the obligatory contrastive effect on *wa* sentences with indefinite nouns, such as sentences in (20) discussed in Kuno(1973):

(20) a. *Nanninka wa buzi nogareta.*

some safely escaped

'Some people escaped safely.'

⁶Haiman(1978) argues for the close relationship between conditional and topics.

- b. Dareka wa (itsumo) kesseki suru.
someone (always) is-absent
 'Someone is always absent.'
- c. Sono paatee ni oozei no hito wa kita. (cf. Hito wa oozei
that party to many people came (people many
kita.)
came)
 'Many people came to that party.'

Although they are not in Milsark's list, numerals have to be treated as strong, too. In fact, Milsark implies such a possibility (1977: 17ff) but excludes it, mainly because of the acceptability of strong reading of numerals in English is "subtle and elusive in the extreme". However, numerals with *wa* are perfectly acceptable in Japanese. Examine (21):

- (21) a. Gonin wa gaizinda.
five people foreigner
 'Five people are foreigners.'
- b. Sitinin wa totyude deteita.
seven people half way left
 'Seven people left halfway through (the movie).'

In (21), the numerals are read as "strong", i.e., five people of the limited group to which five people belong and the domain of quantification is contextually defined; that is to say, "the limited group" is contextually recoverable.

Note that (21) has another reading, which originates from a collective and anaphoric reading of *gonin* or *sitinin*, that is to say, *the five people* or *the seven people*. *Gonin* and *sitinin* are treated like pronouns rather than cardinal words. This is also a strong reading in the Milsark's classification but the sentences are non-contrastive. Thus, the "contrastive" effect is associated not just with a strong reading but with the partitive reading of that strong reading.

Now, let us look at the contrastive sentences from a little different direction. When we compare A and B, they have to be members of the same set. In (22) *ringo* and *mikan* belong to a set of fruits which "you" like. Likewise, in (23), a set of number which "you" can choose. Without the existence of such a commonly shared set, a comparison does not make sense as shown in (23).

- (22) a. Ringo to mikan dewa dotira ga sukidesuka.
apple and orange which like Q
 'Which do you like, apples or oranges?'
- b. San to siti dewa dotira o erabimasuka.'
three and seven which choose Q
 'Which do you choose, three or seven?'
- (23) a*. Ringo to san dewa dotira ga sukidesuka.
 'Which do you like, apples or three?'
- b*. Ringo to san dewa dotira ga oisidesuka.
tasty
 'Which is tastier, apples or three?'

c*. Ringo to san dewa dotira ga interidesuka.'

intelligent

'Which is more intelligent, apples or three?'

The same thing seems to be true for contrastive. In (24)=(20a), "some (of them who escaped)" contrasts with "others (who did not)" and *some* and *others* are the people in a wrecked ship, in an emergency landing airplane, etc.; whatever implied in context.

(24) Nanninka wa buzi nogareta.

'Some people escaped safely.'

This observation is supported by the assumption that a NP(-wa) has the strong reading, "x of the X". Look at (25).

(25) a. Nanmintati wa hidoku tukareteita. Ooku ga/wa

refugee very be-tired many people

sono mati ni shibaraku todomaru koto ni sita. Daga,

that town in for a while stay decided but

nanninka wa sarani saki ni susunda.

some people went-further

'The refugees were exhausted. Many decided to stay in that town. But, some went further.'

b. Takasi wa usagi o katteiru. Nihiki wa massiro na yatu,

rabbit raise two pure-white one

sanbiki wa makkuro, sosite nokori wa zenbu butida.

three deep-black and the rest all speckled

'Takasi is raising rabbits. Two are pure white ones, three are deep-black, and the rest are speckled.'

In (25a), "many of the X" contrasts with "some of the X" and X is *tukareteiru nanmin*, "exhausted refugees" or *nanmin*, "refugees" under the discussion; in (25b), "two of the X", "three of the X" and "the rest of the X", and X is *usagi*, "rabbits" under the discussion.

Next we will discuss the consequence of adapting such a view in contrastive reading.

4. CONTRASTIVE EFFECT. In the contrastive-thematic dichotomy we get three types of *wa* sentences: a generic sentence which is non-contrastive as in (26a); a sentence which is ambiguous as in (26b); and a sentence with an indefinite noun, which is always contrastive as in (26c).

(26) a. Kuzira wa honyuurui da.

'A whale is mammal.'

b. Taroo wa gakusei da.

student

'Taro is a student.'

c. Gonin wa kita.

five people came

'Five (of them) came.'

In my analysis, *gonin* in (26c) receives the strong(partitive) reading because of the nature of NP followed by *wa*. *Gonin* enjoys a salient status among others in the limited set "of the X"; *gonin* stands out

against the ground like in a figure-ground relation. At the same time, *gonin* works as a contrastive focus in Dretske(1972)'s term and the statement "five people(of the X) came" contrasts with "the other people(X-five) did not come". Likewise, in the contrastive case of (26b), "Taro who is a student " contrasts with "the others who are not students or not clear in terms of their status" on the ground of X to which *Taroo* and the others belong. In this figure-ground opposition, the vaguer and the broader the ground is, the less salient the figure becomes. That is, if X is well restricted, the contrastive opponent becomes more narrowly definable; then, *Taroo* vs. the others contrast gets more articulate. A generic sentence like (26a) is generally not considered contrastive, but it is because the X is very vague. Japanese has a word, *shinrabanshoo* which includes all things in the universe. X could be *shinrabanshoo*, living creatures, fishlike creatures, etc., depending on context. If an proper context is provided, the sentence(26a) is indisputably contrastive as in (27)(=8)):

(27) A: Umi ni iru mono de hire ga aru toittara sakana ni
kimatteiru zyanaika.

'If it inhabits the ocean and has fins , it must
be a fish.'

B: Sooto wa kagiranaisa. Kuzira wa honyuurui da yo.

'Not necessarily. A whale is a mammal, you know.'

Here, X is restricted to a set of creatures in question which inhabit the ocean and have fins.

Now, a peculiar phenomenon observed in (28).

(28) a. Takasi ga usagi o kaihazimete itinen ni naru.

rabbit start-to-raise one year passed

Nanbikika wa moo sudeni kodomo o undeiru.

some already child have-born

'One year has already passed since Takasi started to raise
rabbits. Some have already borne young.'

b. Takasi ga usagi o kaihazimete itinen ni naru. Sono uti no
among them

nanbikika wa moo sudeni kodomo o undeiru.

'One year has already passed since Takasi started to raise
rabbits. Among them, some have already borne young.'

The difference between (28a) and (28b) is that (28b) has an overt "of the X", *sono uti no*, while (28a) has no such a phrase. Interestingly enough, the contrastive implication has faded somewhat in (28b) with the overt "of the X". Compare (29) with (30):

(29) a. Nanninka wa buzini nogareta. (=24))

'Some (of them) safely escaped.'

b. Hansuu wa itumo atumari ni okureru.

half always meeting be-late

'Half (of them) are always late for the meeting.'

(30) a. Sono fune no nanmin wa buzi nogareta.

that ship

'Some people in that boat escaped safely.'

- b. Watasi no guruupu no hansuu wa itumo atumari ni okureru.
my group
 'Half of the people in my group are always late for the meeting.'

What is happening here is: in (29), even without the overt expression, "of the X", these sentences are firmly connected to the previous discourse with the contextually unique set, X; in other words, the X is unambiguously definable in the context. On the other hand, in (30), without those expressions, *in that ship* or *in my group*, the connection between two sentences is weak; that is, the set is less definable. Accordingly, the contrastive effect is largely reduced in (30), if not totally eliminated.⁷ Notice that *in that ship* defines the set but not the contextually unique set, X itself.

Now, what happens when (26a) is embedded in the contrastive construction:

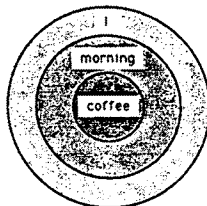
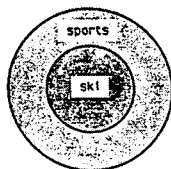
- (31) Kuzira wa honyuurui da ga same wa gyorui da. (=4)
 'A whale is a mammal but a shark is a fish.'

In (31), the sentence explicitly states what contrasts with what: *whale's being a mammal* vs. *shark's being a fish*. Here, we have two foci, *Kuzira* and *same* contrast each other, instead of one. In the next, we will examine the characteristics of multi-*wa* sentences in connection with contrastive.

5. CONTRASTIVE CONSTRUCTION AND NESTING. The contrastive discussed in this section is locally given within the domain of syntactically restricted construction. First look at the so-called multi-topic construction in (32):

- (32) a. [Supootu wa [(huyu ni) sukii wa simasu]] ga, hokani
sports (in the winter) ski do except-that
special thing do-not-do
 '[lit.] As for sports, as for ski, I do (in the winter), but I do not do anything else, particularly.'
 b. Watasi wa [asa wa [koohii wa [nomimasen]]].
I morning coffee do-not-drink
 '[lit.] As for me, as for in the morning, as for coffee, I do drink it.'

c.



⁷ Kuno(1973) classifies this type not as contrastive but as thematic, claiming that "the NP *no Quantifier* construction can enter into the theme rather freely."[: 47]

In this type of construction, it is observed that the leftmost NP-*wa* is thematic and the rest are contrastive (Kuno, 1973). My reading of those sentences is: the contrastive effect becomes stronger toward the right in the sentences and the rightmost NP-*wa* gets the strongest contrastive reading. This can be explained by assuming the nesting structure for sentences such as (32c). The first topic NP in (32a) is *sports* and among the possible members of *sports*, *ski* is chosen as the second topic. In (32b), on the ground of the topics about *I*, (*in the*) *morning* is chosen, which in turn serves as the ground for the topic, *coffee*. Here, the preceding Np's marked by *wa* serve as "of the X". The more restricted the ground, the more distinctive the figure.

It is known that the multi-topics resist scrambling. An explanation given for the phenomenon in my analysis is: the sets, X's, represented as NP(-*wa*)'s are nested as a set-member relation, which naturally resists the scrambling.

Next, observe (33):

- (33) a. Watasi wa [asa wa [koohii o nomimasen]] ga
 I morning coffee do-not-drink but
 [hiru (ni)wa [(koohii o) nomisasu]].
 daytime (coffee) do-drink

'I do not drink coffee in the morning but do drink it in the daytime.'

- b. Watasi wa [asa wa [[koohii wa [nomimasen]]] ga
 I morning coffee do-not-drink but
 [otyawawa [nomisasu]]].
 tea do-drink

'I do not drink coffee (in the morning) but drink tea in the morning.'

- c*. Watasi wa [asa wa [koohii wa [nomimasen]]] ga
 I morning coffee do-not-drink but
 [hiru (ni)wa [otya wa [nomisasu]]].
 daytime tea do-drink

'I do not drink coffee in the morning but do drink tea in the daytime.'

- d*. Watasi wa [asa wa [koohii wa [nomimasen]]] ga
 I morning coffee do-not-drink
 [hiru (ni)wa [koohii wa [nomisasu]]].
 daytime coffee drink

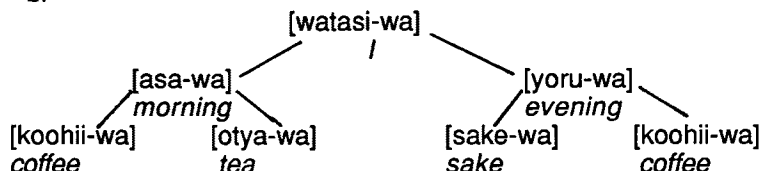
'I do not drink coffee in the morning but drink it in the daytime.'

In (33a), *morning* and *daytime* contrast on the ground of *I* (topics concerning *I*); in (33b), *coffee* and *tea* contrast on the ground of (topics concerning) *morning*, for which *I* serves as the ground, X. There is a restriction on the contrastive structure: in (33c), the NP, *otya*, nested in the larger NP, *hiru*, cannot contrast with the other NP, *koohii*, also nested itself in the larger NP, *asa*; once two items contrast each other, they cannot serve as ground any more (cf. *asa* and *hiru* in (33d)). That is to

say, items under sister nodes in the parallelism only can contrast each other as shown in (34b).

- (34) a. Watasi wa [asa wa [koohii wa nomu] ga [otya wa nomazu]],
 I morning coffee drink but tea do-not-drink
 [yoru wa [sake wa nomu] ga, [koohii wa nomanai]].
 evening drink but coffee do-not-drink
 '[lit]. As for me, as for in the morning, I drink coffee but I do
 not drink tea; however, as for in the evening, I drink sake but
 do not drink coffee.'

b.



This is why (35b) is not well-formed while (35a) is.

- (35) a. Taroo wa kuruma o katta ga Ziroo wa booto o katta.
 car bought but boat bought
 'Taro bought a car but Ziro bought a boat.'

b*. Taroo wa kuruma wa katta ga Ziroo wa booto wa katta.
 c. [Taroo-wa] [Ziroo-wa]

[kuruma-wa] [booto-wa]
 car boat

Kuruma and *booto* are not in a sister node relationship as shown in (35c). There is a case that the contrastive locally takes place in unparallelled structure. Look at (36):

- (36) Ziroo wa [Taroo wa katta] hon o kawanakatt.
 I bought book did-not-buy
 'Ziroo did not buy the book which Taro bought.'

Here, the relative clause and the main clause contrast. *Taroo-wa* and *Ziroo-wa*⁸ are not in a sister-node relation syntactically but they are in a sister relation in the contrastive parallelism scheme, i.e., *Taro's book-buying* vs. *Ziro's non-book-buying*.

Now, those contrastives within syntactically restricted environments are different from the contrastive discussed in the previous sections in the way the contrastive effect is given.

- (37) [Nanninka wa [[syokuzi wa sita] ga [heya wa torazu]],
 some meal had but room take

[nanninka wa [[heya wa totta] ga [syokuzi wa sinakatta]].
 some room took but

'Some people ate there but did not stay (in the hotel), while
 some(other) people stay but did not eat.'

⁸ *Wa* normally can not appear within a subordinate clause unless it is contrastive.

Notice here, the first *nanninka* contrast with the second *nanninka* in this construction, but at the same time those two *nanninka* are also contrastive on the ground of the X under the discussion.

6. CONCLUSION. Through the observations and arguments, we come to the conclusion that the contrastive effect is induced by two factors: the semantic property of the subject NP of the predication sentence and the contextual environment of the *wa* sentence in question. Interaction between those two produces various degrees of contrastive. In this analysis, the difference between contrastive *wa* and thematic *wa* is dissolved and they are no longer distinctive categories. In the last section, within syntactic constructions with more than two foci marked by *wa*, the gradation of contrastiveness and the mode of contrastive parallelism were observed.

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TURNING LINGUISTIC RETICULA INTO LINGUISTIC TREES

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The present paper and another paper which is now awaiting publication (Herrick to appear) are intended to describe part of a model of what happens during the transduction of an utterance through a language. Both of these papers assume that the trace of such a transduction actually consists of many separate, simultaneous trace-impulses. Both of these papers also assume that the tactic patterns of a language are insufficient to show how the trace-impulses which make up a trace are related to one another, and they assume that another way must be found to show the relationships that exist among those trace-impulses while the transduction of an utterance is running through a language.

Herrick to appear describes a way of showing how the trace-impulses of a given realization are related to one another while they are running through one level of language. The present paper, using the notation described in Herrick to appear, investigates two more questions about the same model of a linguistic transduction:

- (1) how to delimit, within the lowest level of the semological reticulum, the reticulum segment¹ which will be realized by a given utterance, and
- (2) how the structure of such a reticulum segment can be realized by a lexemic tree.

The semological reticulum in figure 1 shows part of the knowledge that is in the head of a person who can produce the utterance

I found Cindee at the museum,
and she gave me her luggage.

This reticulum shows how the trace-impulses for the transduction of this utterance are related to one another while they are passing through the lowest level of the semology. (It says nothing about how the utterance is realized from one level of language to another.)

For the notation used in figure 1, the plane of the paper on which the diagram is printed corresponds to the level of language, and the trace-impulses run through the plane of the paper in a direction perpendicular to it. Because this reticulum is assumed to represent the lowest level of the semology, the trace-impulses running through it are shown as semons; each symbol with prefix "SN" therefore represents the point where one trace-impulse runs through the plane of the paper. The other symbols in this diagram, which show the relationships

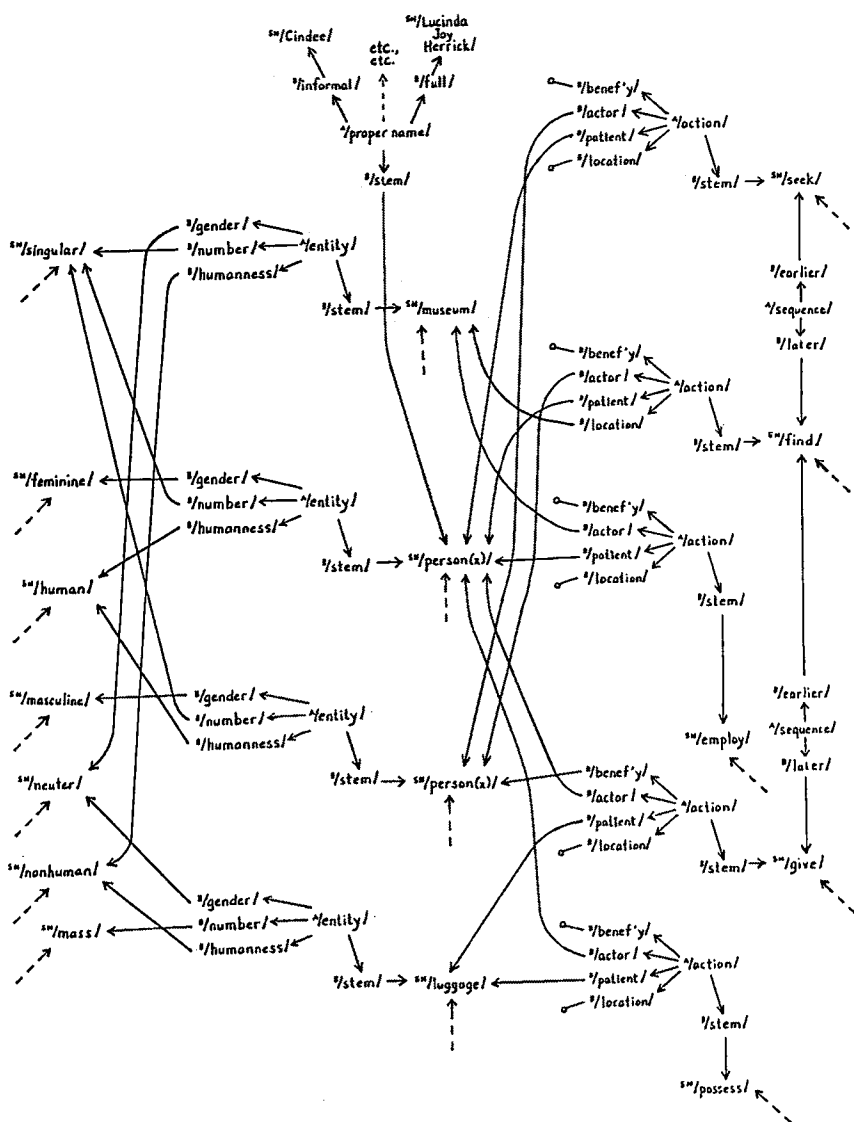


Figure 1.

among the trace-impulses as they run through this level, are of two kinds. Some of them, which Taber (1966) calls relationals, are here called "arachnes"² and are shown by symbols with prefix "A". The others, which are the poles of these relationals, are here called "brachions"³ and are shown by symbols with prefix "B".

This reticulum has several characteristics: Each semon occurs only once. Each arachne (and the brachions which belong to it) may occur more than once, but if it does so, then its several occurrences are distinguished from one another by arbitrary numbers. There is a special semon, SN/person(x)/, which can occur more than once; each of its occurrences refers to a different human being, and its occurrences are distinguished from one another by arbitrary numbers.

Figure 1 contains four groups of semons. Those along its left edge refer to inflectional facts about things or people.⁴ Those down its middle refer to things or people involved in the utterance. Those along its right edge refer to actions involved in the utterance. Toward the top of the diagram, there are some more semons clustered around A/proper name/.

Figure 1 includes two other groups of arachnes. On its left side are four occurrences of A/entity/, each of which has four brachions; three of these, which represent inflectional categories, point leftward toward the inflectional semons; the fourth, B/stem/, points rightward toward a semon referring to a thing or person. On the right side are five occurrences of A/action/, each of which has five brachions; four of these, which represent roles in the action, point leftward toward the semons that refer to the things and people playing those roles in this utterance; the fifth, B/stem/, points rightward toward a semon referring to the action.

What is shown in figure 1 is only a tiny part of the knowledge in the head of some human being. That human's entire knowledge actually forms an immensely larger reticulum, which is suggested in figure 1 by the arrows with dashed shafts pointing toward the semons.

When the person whose knowledge is represented in figure 1 produces this utterance, that person must begin by defining, within the reticulum shown in figure 1, a reticulum segment corresponding to this utterance. In order to define such a reticulum segment, a potential speaker/writer of an utterance must do the following things:

- (1) Delimit the part of the reticulum that will form the reticulum segment.
- (2) Specify the sequence that constitutes the story line of the utterance.⁵
- (3) Mark the producer (the speaker or writer) and the perceiver (the hearer or reader) of the utterance, if they occur within the reticulum segment.
- (4) Mark the ends of any temporal sequences and spatial sequences that occur within the reticulum segment.
- (5) Mark the time and/or the place at which the utterance is produced, if the ends of any temporal and/or spatial sequences are marked.
- (6) Indicate which items of knowledge are shared by the producer and the perceiver.

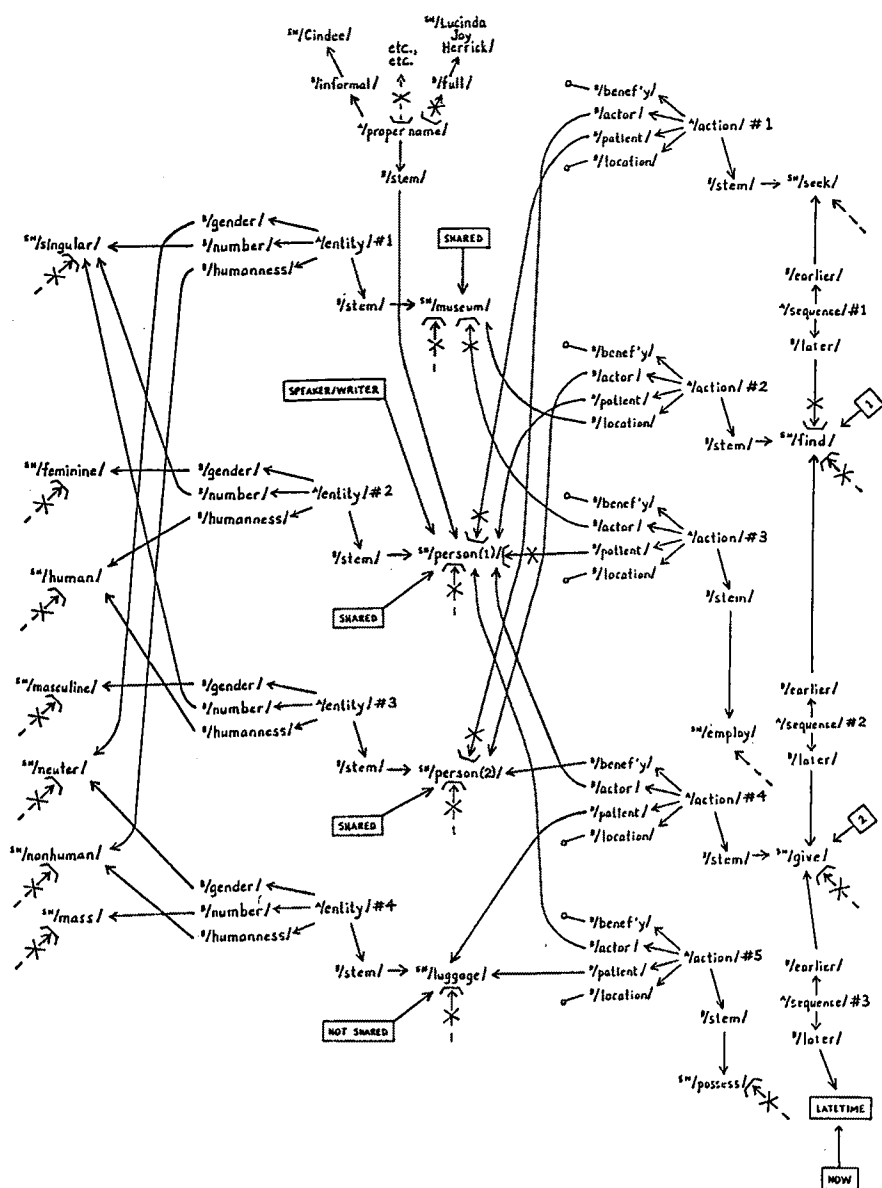


Figure 2.

These things which must be done in order to define a reticulum segment can be called the "ekeinic"⁶ processes, because they are what a person must do to a semological reticulum before producing this or that specific utterance. The effects of the ekeinic processes are shown in figure 2, which consists of figure 1 with added marks that show where these processes have been applied, as follows:

(1) The reticulum segment has been delimited by cut-off lines and x's that remove connections to the parts of the reticulum that are not included in the reticulum segment. Some of the connections removed are those to the unshown parts of the semological reticulum which are suggested in figure 1 by the arrows with dashed shafts. Within the part of the reticulum that is shown in figure 1, the speaker/writer has chosen to not mention in this utterance that he/she was looking for Cindee; SN/seek/ and all the connections through the brachions belonging to its copy of A/action/ have therefore been removed. And because the speaker/writer has chosen to not say something like "Cindee, who works at the museum", SN/employ/ and the connections through the brachions belonging to its copy of A/action/ have also been removed.

(2) The story line's sequence has been specified by adding the boxed numbers "1", with an arrow pointing to SN/find/, and "2", with an arrow pointing to SN/give/.

Several kinds of labels (written here in rectangles) have been added in order to preserve the situation in which the utterance is produced.

(3) The label "speaker/writer" has been added, with an arrow pointing to SN/person(2)/, in order to show which person is the the producer of the utterance.

(4) and (5) Because the reticulum segment contains a temporal sequence, the relationship between that sequence and the time when the utterance is produced must be preserved. In figure 1, there is an occurrence of A/sequence/ with its B/later/ pointing to SN/give/. As part of the ekeinic processes, this temporal sequence has been extended by adding the label LATETIME and by adding another occurrence of A/sequence/, with its B/earlier/ pointing to SN/give/ and its B/later/ pointing to LATETIME. The relative time at which the utterance is produced has been shown by adding the label NOW, with an arrow pointing to LATETIME.

(6) Labels have been added with arrows pointing to some of the semons in order to show whether or not knowledge of them is shared by the producer and the perceiver of the utterance.

When the cuts, deletions, and additions indicated in figure 2 have been made, the result is the reticulum segment shown in figure 3, which is the reticulum segment that will realized by this utterance.

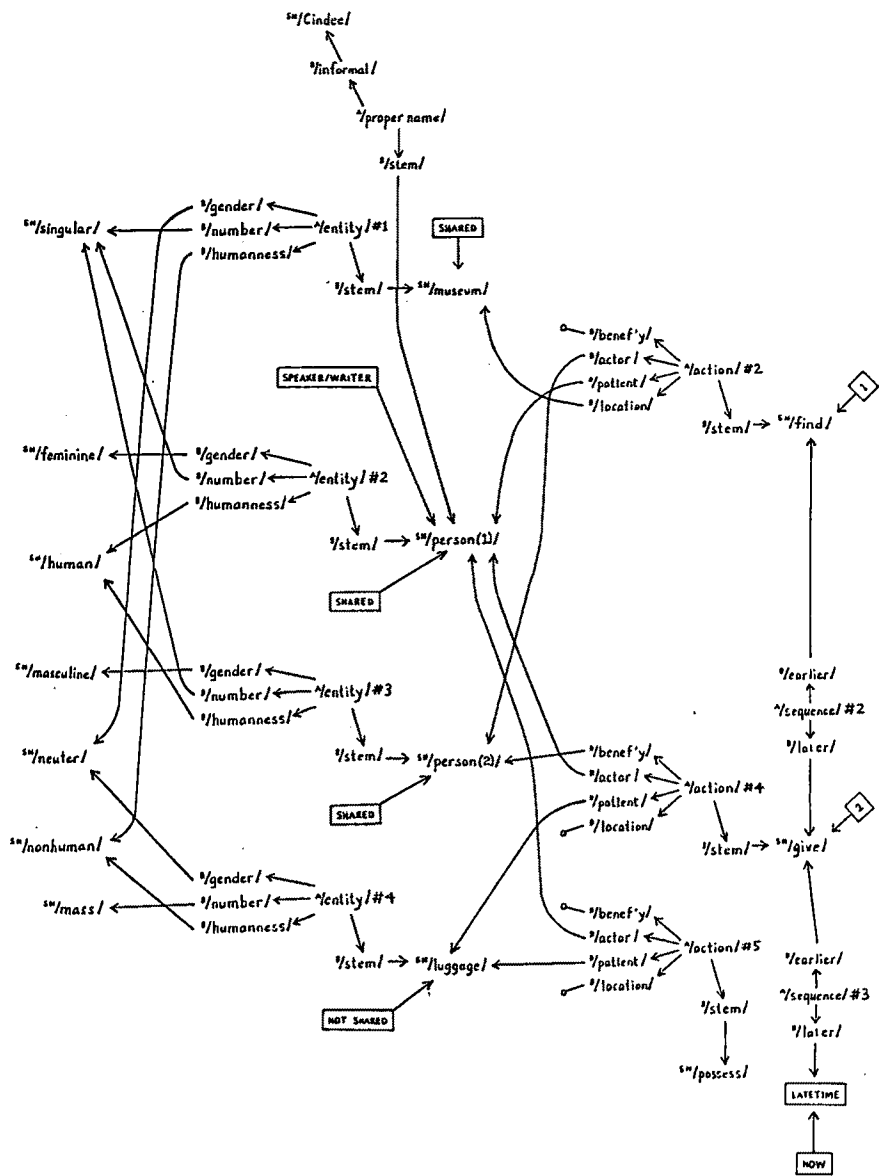
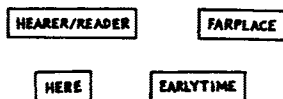


Figure 3.

Some other possible ekeinic labels, such as



are not needed for this reticulum segment because it does not contain the perceiver of the utterance, because it contains no spatial sequence that has been cut, and because no future time is involved in the realization.

The entire semology which is in the head of a human being is probably not susceptible to being modeled by a computer program. However, if it becomes possible to construct a computerized model of how an utterance is transduced from its meaning to its spoken or written expression, that computerized model will have to begin its operation by using the appropriate reticulum segment from the semonic level, and that computerized model will have to be told how that reticulum segment is construc-

Cindee	informal	ppr.name	1	
L.J.H.	full	ppr.name	1	
person(1	stem	ppr.name	1	
singular	number	entity	1	
nonhuman	hum'ness	entity	1	
neuter	gender	entity	1	
museum	stem	entity	1	
person(1	stem	entity	2	
feminine	gender	entity	2	
singular	number	entity	2	
human	hum'ness	entity	2	first column:
person(2	stem	entity	3	semons
masc'ine	gender	entity	3	
singular	number	entity	3	second column:
human	hum'ness	entity	3	brachions
luggage	stem	entity	4	
neuter	gender	entity	4	third column:
nonhuman	hum'ness	entity	4	arachnes
mass	number	entity	4	
museum	location	action	2	fourth column:
person(2	actor	action	2	distinguishing
person(1	patient	action	2	numbers for
0	benef'y	action	2	arachnes
find	stem	action	2	
0	location	action	4	
person(1	actor	action	4	
luggage	patient	action	4	
person(2	benef'y	action	4	
give	stem	action	4	
0	location	action	5	
person(1	actor	action	5	
luggage	patient	action	5	
0	benef'y	action	5	
possess	stem	action	5	
find	earlier	sequence	2	
give	later	sequence	2	
give	earlier	sequence	3	
LATETIME	later	sequence	3	

Figure 4.

ted. This can easily be done, because each semon of a reticulum segment has a unique name and each of its arachnes is uniquely designated by its name and an arbitrary number; each part of the reticulum segment can therefore be represented by a line of data containing a semon, a brachion, and a numbered arachne. The lines of data in figure 4 can therefore be used as the input data for a computerized model of the transduction of the reticulum segment in figure 3. (From another point of view, figure 4 can be regarded as a do-it-yourself kit from which a person can assemble the reticulum segment in figure 3.)

As this utterance is transduced from the semology to the lexology, the reticulum in figure 3, which shows the relationships among its trace-impulses on the semonic level, is realized by the tree in figure 5, which shows the relationships among its trace-impulses on the lexemic level. The realization formulas for transduction between these two levels are not shown here; their only effect is to convert a linguistic reticulum into a linguistic tree. To do so, these formulas preserve the connections among the successive parts of the story line, and they break enough connections at other semons so that the result will be a tree. Whenever these formulas break the connections at any semon, they make multiple copies of that semon and of everything on the side of it away from the story line, and they attach those copies to the appropriate different branches of the tree. Except for making copies of such semons and of what is connected to them, these formulas provide only for one-to-one realizations of semons by lexemes and for one-to-one realizations of arachnes and brachions on the semonic level by arachnes and brachions on the lexemic level.

After the semological reticulum has been broken apart into a lexological tree, some parts of the reticulum will be realized within the tree by multiple copies, located at the ends of all the tree's branches where they may possibly be needed. That tree must then be severely pruned, so that realizations of such parts of the reticulum will occur only at the places within the tree where they are indeed needed.

Some of this pruning can be done while the lexemes in figure 5 are being realized. Because L/person(2)/ is marked as "speaker/writer", it will be realized only by the pronoun "I/me/my/mine/myself" (the case of which will be decided at a lower level), and everything else attached to its occurrence of A/entity/ will be ignored. However, the realization of L/person(1)/, which occurs three times in figure 5, will be more complicated. Its first occurrence will be realized by the proper name "Cindee", and all the inflectional facts attached to that occurrence of L/person(1)/ will be ignored; but for its other two occurrences, the proper name will be ignored, and the lexeme and its attached inflectional facts will all be realized by the pronoun "she/her/her/hers/herself".

More pruning of this lexemic tree will be done at lower levels of the language. The two occurrences of A/sequence/ and the markers LATETIME and NOW will all be eventually realized by past time morphemes joined to verb stems. L/museum/ occurs only once in this reticulum segment, so its inflectional facts are not needed

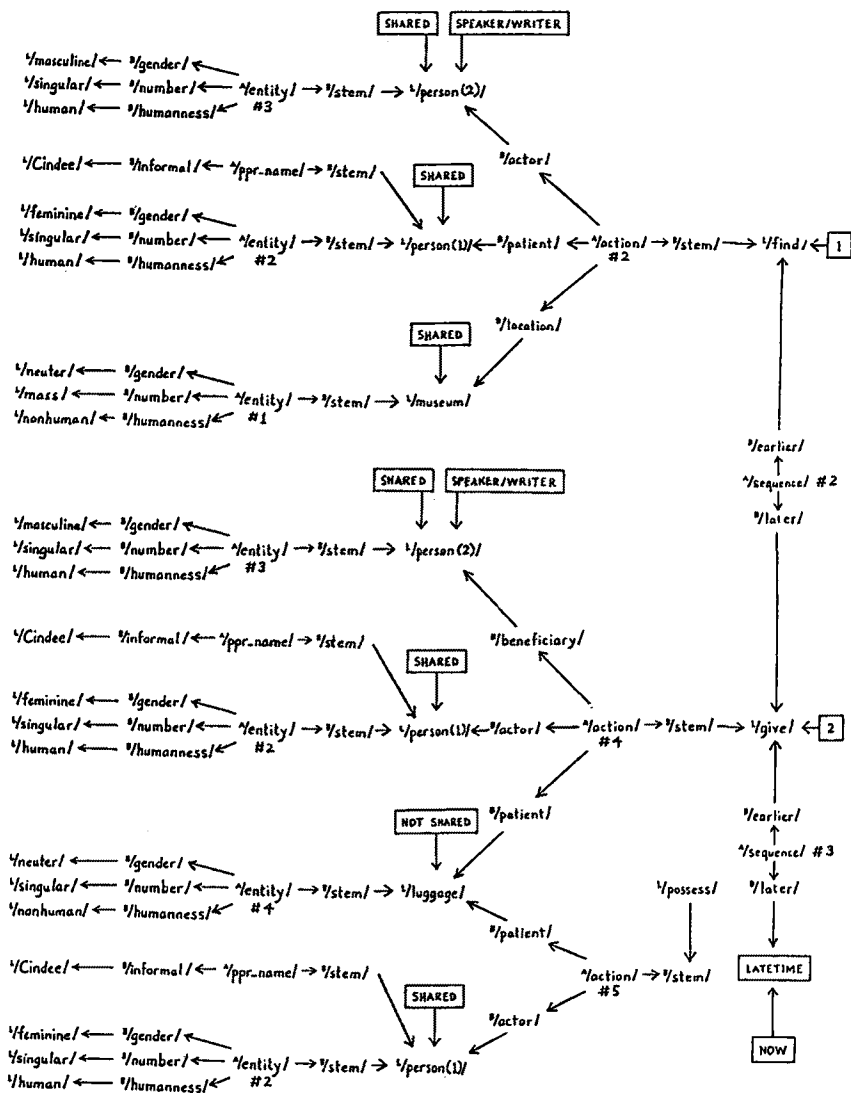


Figure 5.7

for selecting a pronoun and will be ignored. However, knowledge of L/museum/ is shared by the speaker/writer and the hearer/reader, and the fact that they share it will eventually be realized by the definite article 'the'.

There is a problem involving SN/luggage/. It is realized by 'luggage', which is a mass noun, but that noun has a possible synonym 'suitcase', which is a count noun. The semology should perhaps contain, instead of SN/luggage/, a semon that can be realized by either 'luggage' or 'suitcase'; but the use of such a semon would require reconsideration of how inflectional facts are attached within the semological reticulum.

The realization of proper names is also a problem. Each human being ordinarily has several names, and a complete linguistic analysis will need to define the circumstances under which each of them is used. For example, the author's oldest daughter has, at one time or another, been known by all of these names:

Lucinda Joy Herrick
L. J. Herrick
Cindee Herrick
Cindee
Miss Herrick

Lucinda J. Herrick
Lucinda Herrick
Cindy Herrick
Cindy
Ms. Herrick

Her friends and family now call her "Cindee"; she formerly was known as "Cindy" (pronounced in the same way); she signs her checks "Lucinda J. Herrick"; as a professional museum administrator, she prefers to be known as "Cindee Herrick". In figures 2, 3, and 5, the name "Cindee" has been selected because the speaker/writer and the hearer/reader share knowledge of her.

The present paper and Herrick to appear use their notation to show how the trace of an utterance is organized during transduction within the lowest level of a semology and also within a lexology. A similar notation, which shows how a trace is organized within a graphonomy, is used in Herrick 1987. It remains to be seen whether this notation is necessary and sufficient to show how transductions of utterances are organized within all the levels of all the stratal systems of a language other than its semology.⁸

ENDNOTES

1. The term "reticulum" is used here to mean the vast structure that represents the entire knowledge of some human being; it contrasts with "reticulum segment", which is used here to mean the part of a reticulum that is realized by a given utterance. These terms are formed by analogy with the mathematical terms "line" and "line segment", the former of which means something of unbounded extent, and the latter of which means a bounded part of the former.

2. Arachne is the Greek word meaning 'spider'.
3. Brachion is the Greek word meaning 'arm'.
4. The only function of SN/human/ and SN/nonhuman/ is to regulate the alternation between the relative pronouns "who/whom/whose" and "which". They have nothing to do with the sorts of things that human beings can or cannot do.
5. In Herrick to appear, it is implied that the reticulum segment for an utterance can be delimited first and that its story line can be specified later. However, it seems more reasonable to say that what speakers or writers ordinarily do is to define, as part of the same mental activity, what they are going to speak or write about and how they are going to organize their speaking or writing. Both the delimiting of the reticulum fragment and the specifying of the story line within that fragment will ordinarily be parts of a single process.
6. This term is based on the stem of the Greek demonstrative ekeinon, meaning 'that'.
7. This diagram is mathematically a tree because, if there is a path running through it from one of its points to another of its points, then the only path from the second of those points to the first of those points runs through the same intermediate points as the first path does. The directions of the arrows in this diagram are ignored when drawing such paths through it.
8. The author wants to thank Sylvia Candelaria de Ram for so gently (and frequently) suggesting that he could be working on stratificational models of semology.

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"THE GORGEOUS EAST": PRECEDENTS FOR COLLOCATING
AN ADJECTIVE WITH A CERTAIN NOUN

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As much as in any past century, if not more so, it is fashionable nowadays to put a great deal of weight upon independence and creativity. Although the motto "Do your own thing" has lost its freshness, we would still like to believe that every individual has at least a spark of originality, which ought to be respected by others, and that something uniquely precious is crushed when the circumstances do not encourage him (or her) to express it.

The application of this sentiment to language leads to a peculiar paradox; for any language is obviously learned from other people, most of them older than ourselves, but as we gain skill or fluency in the use of it, we indeed become able to say things we have not heard before. Not that very many of us form new words, but we spontaneously use the existing ones in many new combinations. Whether or not those combinations occurred to someone before us, a combination is in fact new to each of us if we never met it in our own experience. But on the whole we do not notice the newness; any normal child just takes it in stride. For example, after hearing *your hand, your foot, your nose*, etc., quite a few times, as well as *my hand, my foot*, the child need not strain his budding intelligence to come up with *my nose* whenever the occasion calls for it. An elementary but indispensable principle of English, which concerns what the grammarians call possessive adjectives, is readily mastered at an early age; and from then on, the particular manifestations of it take care of themselves, with no burden upon anyone's attention or memory. I for one cannot recall ever saying or hearing either *my pancreas* or *your pancreas*; for luckily mine has never caused me trouble, nor has anyone in my conversational circle been stricken in that part of the body. But this does not, of course, diminish the store of English expressions that I can draw upon.

Every item of vocabulary that we learn to use has been met in context — for the most part in a variety of contexts. Unless we have been subjected to a perverse, unnatural pedagogy that assigns a list of utterly unfamiliar words to be looked up in the dictionary, we begin in the normal way, by being exposed to clues, at least, as to the meaning;

and so we have already started moving toward the knowledge of how to use the new word ourselves, in a similar context at some later time. Little by little we form a GENERALIZED memory of what sort of words it goes with readily. Who it was that said such-and-such in our hearing, seldom registers upon us for long, unless this happened to be a favorite formula of a certain elder – something that Mother or Father was in the habit of saying time and again, as my mother often told me, “Chalk it up to experience.” But otherwise our vocabulary does not depend upon REMEMBERED sources.

Some songs, to be sure, that we learned by heart constitute a conspicuous, if minor exception. When I say “no place on earth” and then, uncharacteristically, I take a moment for a second thought, I recall that it is from “Carry Me Back to Old Virginny”.¹ That differs somewhat from an intentional quotation, as in “We got out of bed ‘by the dawn’s early light” – any American would recognise that as coming from “The Star-spangled Banner”. Also poems memorized without music, and a few noteworthy prose texts, such as the Ten Commandments, can supply us with quotations. Most people are aware, when they say “an eye for an eye”, that they are quoting the Bible.

I would like to dwell upon an unusual manner of transmitting vocabulary: where a combination is not familiar, but still traceable through a lucky circumstance. It should serve to correct, or at rate to restrict, the view of some linguistic scholars that in speaking we freely combine whatever words are GRAMMATICALLY compatible, unless they produce a SEMANTIC incongruity, such as Chomsky’s *green ideas*. This mistaken – or exaggerated – principle has grown out of analyzing language into grammar and vocabulary; the two categories are indeed helpful for the focusing of linguistic inquiry, but by no means do they constitute a clear, valid, and exhaustive dichotomy. Granted that *green ideas* is not wrong grammatically, I would rather look for what in fact prompts us to combine SOME grammatically compatible words, but not others.

The speakers of English have never used the great bulk of the combinations that would, potentially, come to their lips if semantic incompatibility were the only barrier. Instead, our usage of vocabulary is shaped mostly by PRECEDENTS that have impressed us. I find this inescapable from the social nature of language, which – while allowing

¹ At the session in Chicago I mistakenly attributed this song to Stephen Foster; afterwards David Lockwood graciously pointed out to me that this is a long-standing confusion. The real author was James Bland (1854-1911), a black musician; Foster wrote “My Old Kentucky Home” on a similar theme.

innovation — keeps every individual communicating mainly by the RE-USE of what someone else in the past has successfully communicated to him.

My illustrations here will mainly take the form of adjective combined with noun — a very prominent type in English (and many other languages).² Apart from manifest quotations, the contexts from which we have learned the meaning of a word are so miscellaneous that they have no separate niche in our memory. For each of us the phrase *a good meal* goes back to many, many experiences. Even the combinations that are much less routine than that hardly ever lend themselves to tracing. But one that can be traced — namely, "the gorgeous East" — has struck my eye; or, more precisely, it has haunted my mind's ear, because I liked it so much. As I am no poet but a lover of poetry, I myself use this expression only in repeating the favorite poems where it occurs, and now as a linguist in sharing with other linguists my thoughts about it.

Many years ago I read Wordsworth's sonnet *On the Extinction of the Venetian Republic*:

Once did She hold the gorgeous East in fee;
And was the safeguard of the West: the worth
Of Venice did not fall below her birth,
Venice, the eldest Child of Liberty.
She was a Maiden City, bright and free:
No guile seduced, no force could violate;
And when She took unto herself a Mate
She must espouse the everlasting Sea.

And what if she had seen those glories fade,
Those titles vanish, and that strength decay.
Yet shall some tribute of regret be paid
When her long life hath reach'd its final day:
Men are we, and must grieve when even the Shade
Of that which once was great is pass'd away.

Eventually I learned it by heart, and at some later time I realized that "the gorgeous East" comes up also in the verses that open the second book of *Paradise Lost*:

High on a throne of royal state, which far
Outshone the wealth of Ormus and of Ind,
Or where the gorgeous East with richest hand

² A last remark about possessive adjectives: These appear to be quite unrestricted except for obvious semantic constraints against **his uterus*, **her testicles*, and the like. A man will have no occasion to say *my husband*, nor a woman to say *my wife*.

Showers on her kings barbaric pearl and gold,
Satan exalted sate.³

For all the power of this epic passage, it might have left no particular impression on me, had it not been quoted directly by the recent poet Leonard Bacon in his dramatic monologue, "An Afternoon in Artillery Walk," where he evokes the unhappy musings of Milton's daughter Mary and ends with the blind poet dictating those five lines. I read Bacon's clever but scarcely memorable composition in a college course on English poetry; thanks to him, I was touched by the difference between his pale, pedestrian language and Milton's vividness. And so I was finally led to the surmise that Wordsworth drew "the gorgeous East" from that one source, written a hundred years or so before he was born.

For lack of an apposite comment by Wordsworth himself, I see no way to determine whether this was a conscious reminiscence of the passage in *Paradise Lost*—whether he had in mind also the context of "barbaric pearl and gold". But at any rate "the gorgeous East" was stored as a unit in his memory of his native language—not just *gorgeous* and *East* separate from each other. To my knowledge, there is no evidence that "the gorgeous East" had become a commonplace between Milton's time and Wordsworth's. Before long we may see the pertinent software from *The English Poetry Full-Text Database*, so as to check the poets in between for any occurrences.⁴ But even if turns out that "the gorgeous East" is indeed lacking in all the other poetry that might have influenced Wordsworth, still we could not rule out the possibility that he encountered it in some prose discourse.

The main reason for attributing "the gorgeous East" in Wordsworth's sonnet to a single source is that he loved and admired Milton so much more than the later poets, as he declares in other sonnets:

Milton! thou shouldst be living at this hour;
England hath need of thee. . . .

and

Scorn not the Sonnet; Critic, you have frowned,
Mindless of its just honors. . . .

and when a damp

Fell round the path of Milton, in his hand
The Thing [i.e., the sonnet] became a trumpet, whence he blew
Soul-animating strains—alas, too few!

³ The archaic form "sate" in Bacon's rendering is not confirmed by the editions of Milton that I have consulted: they give the familiar "sat".

⁴ Up to now the publishers have issued only a limited corpus, all of it antedating *Paradise Lost*.

A strict appraisal of Wordsworth's diction in the sonnet on Venice might find fault with his re-use of the phrase from Milton. For Milton could safely rely upon his readers' awareness of Oriental countries celebrated for the riches of their kings, but Wordsworth's "gorgeous East" is a rather grandiose way to allude to the Peloponnese, the Cyclades, and the other dependencies of Venice at the summit of her power. To be sure, the precise facts of history and economics matter less to Wordsworth than the poetic contrast between the wealth at the disposal of Venice then and now. After all, even if those areas were in themselves poor, the Venetians had used them to keep control over lucrative trade-routes. And Wordsworth, within his own circle, often remarked that he did not read widely, apart from poetry; but he leaned quite a bit upon the learning of Coleridge and other friends.

This sonnet was composed between 1802 and 1807, years after the republic of Venice succumbed to the power of Bonaparte; for he overran all of northern Italy in 1797, and by the treaty of Campo Formio he assigned Venice and most of her territory to the Emperor Francis as a sort of compensation for the loss of Milan and the rest of the long-standing Austrian possessions in Italy. After the news reached England, Wordsworth did not immediately react. Instead, his poetic response came only when he was good and ready to draw upon the resources of his vocabulary in a certain metrical mold. He could afford to wait; for he was not yet the Poet Laureate, more or less obliged to compose promptly for state occasions.

In the same line as "the gorgeous East" he also had a Miltonic precedent for "hold . . . in fee" — namely, the sonnet from the year 1645 (or thereabouts), entitled "On the Detraction Which Followed upon My Writing Certain Treatises":

I did but prompt the age to quite their clogs
By the known rules of ancient liberty,
When strait a barbarous noise environs me
Of Owls and Cuckoes, asses, apes, and dogs;
As when those Hinds that were transform'd to frogs
Rail'd at Latona's twin-born progeny,
Which after held the Sun and Moon in fee. . . .

Here too Wordsworth's context is less august than Milton's, which referred to an episode in Ovid's *Metamorphoses* (6.340-381) about the infancy of Apollo and Diana. *To hold something in fee* was quite ordinary English for centuries. Originally it meant 'to hold by feudal law'; but as a legal term it gradually took on the meaning 'to have absolute ownership', since the lapse of the king's former right to seize

upon real estate⁵ in case the fee-holder defaulted on his military obligation. Milton's sonnet may have been just one of many forgotten sources from which Wordsworth had learned this expression;⁶ but both poets chose it to declare the awesome power of the subject – Apollo and Diana over the sun and the moon respectively, and Venice over the gorgeous East.

For my purpose there is no need to pursue the derivation of Wordsworth's vocabulary any further. But where Milton got "the gorgeous East", and what he did with it, is worth a further search. His source was the comedy *Love's Labour Lost* (IV, iii, 216-20 [238-41]):

Who sees the heavenly Rosaline
That (like a rude and savage man of Inde)
At the first opening of the gorgeous East
Bowes not his vassall head and, strooken blinde,
Kisses the base ground with obedient breast?

Here "the gorgeous East" is the eastern sky at dawn. Milton has applied it creatively to the luxurious Orient. The mention of "Ind(e)" – i.e., India – in the previous line suggested to him a connection that was, at best, latent in Shakespeare's verses. For, thanks to the classical tradition before Shakespeare, we can posit that India, lying far to the east, was thought to enjoy not only an earlier but a grander sunrise than other countries. By my analysis, which rests indispensably upon the recurrence of "Ind(e)", Milton has shifted the splendor from Shakespeare's heavenly scene to the lustrous pearl and gold ornaments worn by the Oriental kings. Wordsworth in turn, fancying Venice to have been the pivot between the East and the West, credits her with once possessing "the gorgeous East".

Love's Labour Lost is hardly a great masterpiece, but even the minor beauties of Shakespeare were not wasted on Milton. His tribute to Shakespeare, written in 1630, shows how the flowing Shakespearian verses were bound to become a resource for a poet of less copious talent:

Thou in our wonder and astonishment
Hast built thy self a live-long Monument.
For whilst to th' shame of slow-endeavouring art,
Thy easie numbers flow, and that each heart
Hath from the leaves of thy unvalu'd Book,
Those Delphick lines with deep impression took. . . .

⁵ *Real* in this combination may be, etymologically, 'kingly, from the king' (from *regalis* rather than *realis*).

⁶ The *Oxford English Dictionary*, however, quotes from Wordsworth's sonnet right after Milton's.

I move now to an adjective-and-noun phrase that a linguist might in the abstract reject as incompatible. It comes in Sidney's book of sonnets, *Astrophel and Stella* (#41):

Having this day my horse, my hand, my lance,
Guided so well, that I obtain'd the prize,
Both in the judgment of the English eyes,
And of some sent from that sweet en'my France. . . .

We can agree that it takes something extraordinary to evoke the combination "sweet enemy". I have not been able to trace any literary precedent in English – for example, a man in love with a lady while their families or countries are at war. But Sidney was an avid and appreciative reader of Petrarch's sonnets, where the beloved is often referred to as "la mia dolce nemica" (or the like) because she will not gratify him.⁷

Sidney transferred the expression to a quite different, unerotic context, where it was nonetheless fitting. For France had been the traditional enemy of England; but the Hundred Years War was now long in the past, and the bitterness of defeat had eased. A fairly recent sequel, though before the birth of Philip Sidney, was the war in which the English lost Calais, their last foothold on the continent, in 1558. However, England had been dragged into this war by the unpopular Queen Mary, in alliance with her husband, the Spanish king Philip II, who had his own motives for making war upon France; and after her death, toward the end of the year, the English were relieved of a futile entanglement. Moreover, in the 1570's, while Sidney was growing up, the aging virgin Queen Elizabeth allowed François, the young Duke of Alençon (later, Duke of Anjou), to court her; this prolonged and inconsequential flirtation was the setting for kindly sentiments toward France, mixed with considerable reserve. Sidney himself was strongly against the proposed royal marriage.⁸

⁷ The passages are listed by Kenneth McKenzie, *Concordanza delle rime di Francesco Petrarca* (Oxford University Press, 1912), p. 280. Angela Della Volpe, at the LACUS Forum, kindly alerted me to this combination in early Italian poetry.

⁸ In 1580 he addressed a long letter to Elizabeth, setting forth all the demerits of the Duke. It was not published until 1663 (reprinted in *The Miscellaneous Works of Sir Philip Sidney, knt., with a Life of the Author and Illustrative Notes by William Gray* [Boston: T. O. H. P. Burnham, 1860], pp. 289-303). Some later historians credited Sidney with swaying Elizabeth's mind decisively against François; but for lack of contemporary evidence I cannot be sure whether the letter was actually sent to her or, on the contrary, served merely to put the author's feelings down on paper, without going beyond his own home or his intimate circle.

His sonnet tells of a victory not in war, but in a sham battle – a joust held somewhere in England and attended by Frenchmen, some in the capacity of judges but also, no doubt, some as contestants. Thus there was friendly but intense rivalry, and an occasion to recollect the wars their ancestors had fought in earnest. France was now "that sweet enemy"; the two countries were on good terms, but the history remained unforgotten and still relevant. For our present linguistic purpose it matters little whether the poem recounts a real or a fictitious joust.⁹ In the world of the poem, with some bearing upon the everyday world, the oxymoron "sweet enemy" made very good sense.

Thus a combination of adjective and noun that intrinsically would seem quite odd may still come about – depending upon some special circumstance and the inventiveness of a certain speaker or writer. It also happens that a combination such as "the gorgeous East", which is manifestly compatible though unfamiliar, gets transmitted only on a high level of talented composition. Sometimes the re-use involves a striking adaptation to a dissimilar context, as Shakespeare's "gorgeous East" – i.e., the morning sky – was applied by Milton to the dazzling riches of the Orient.

But not very much of the huge vocabulary which millions of Anglophones know to some extent, through passive exposure, is in practice available to them for their own use. They remain limited, for the most part, to using the words that they know well, in such combinations and contexts as they also know well. In the course of living, to be sure, their vocabulary grows along with their experience. At the same time, however, some areas of their vocabulary can shrink; for as they move away from older experience, the words associated with it tend to recede from their memory, unless refreshed by talking or writing about the past.

⁹ "Attempts to identify this tournament, if in fact it refers to an actual tournament, have proved fruitless": Sir Philip Sidney, *Selected Prose and Poetry*, ed. by Robert Kimbrough (2d ed.; University of Wisconsin Press, 1983), p. 185, note 1.

A TYPOLOGICAL APPROACH TO IDIOMATICITY*

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General remarks

The present paper attempts to discover some common properties in idiom formation across languages, with body part nouns as central lexical items, referring to English, Japanese, French and German idioms.

I have several reasons for tackling this problem. Firstly, despite the extensive studies of idioms in the past years (Makkai 1972, Strässler 1982, and Akimoto 1983), their focus has been on an individual language, i.e. English, not on multiple languages. Secondly, probably because of the emergence of Greenberg (1963), typological studies have been actively done, mainly on word order (see Croft 1991). I hope to extend the typological analysis to idioms and show some universal principles in idiomaticity among languages. Thirdly, the advancement of cognitive linguistics in recent years has turned our eyes to the relation of cognitive and perceptive abilities to language, and consequently the body parts of human beings as inalienable possessions have come to be regarded as something more directly related in a language in light of human cognition.

On the basis of such interdisciplinary studies, I wish to give some new insight into idiom studies. For several reasons, I have confined myself to the pattern of 'V+O' idioms. The chief reason is that the number of these idioms is the largest, with various grammatical characterizations.

Previous studies

Weinreich (1963: 146) states as follows:

Many languages seem to have specialized grammatical patterns for idioms. In English, for example, a preposition plus count noun without an article (at hand, by heart) often signals idiomaticity. But it is also clear that it is not necessary for languages to have their idioms grammatically marked. The relation of idiom-marking patterns to productive patterns in a grammar would be worth investigating on a cross-linguistic basis.

As will be shown later, uncountability as an idiom marker is characteristic of English, but not conspicuously so in French and German, and not at all in Japanese. Every language seems to show idiom markers to differing degrees. But it seems that Weinreich was the first to propose the necessity of investigating idioms on a cross-linguistic basis.

Fox (1981) discusses the syntax of body part nouns on the basis of data taken from some unrelated languages, and asserts that inalienability is neither necessary nor sufficient to explain the syntactic phenomena of the nouns

Hopper and Thompson (1985) touch on the attached body parts which have reduced categoriality. They say that in French and German, the possessed part is stripped of a possessive pronoun.

Traugott and Hopper (1993: 41, 78, 107) mention two functions of body part nouns. One is as emphasisers, such as talk one's head off and work one's tail off.¹⁾, and the other is as locatives/temporals, such as behind in We are behind in paying our bills.²⁾

A cursory glance at these studies shows that there is much to be done in this area.

Some properties of body part noun idioms

English often loses 'one's' and 'a/the' determiners, when the body part noun becomes idiomatized, as in lose face, keep house and set foot on. French and German have the same usage, as in prendre pied, tenir tête à ...; freie Hand lassen, Fuß fassen, but both languages often keep the definite article instead, as in lever le pied, faire la tête, baisser les bras; den Kopf verlieren, den Mund halten, die Ohren spitzen. Furthermore, French and German use fewer pronouns than English, probably because they both have developed the reflexive systems.

Compared with these European languages, Japanese is peculiar in the lack of number and possessive pronouns attached to nouns. Then how can Japanese distinguish between idioms and non-idioms? It seems that there is a psychological difference of frequency between idioms and non-idioms. The ratio of frequency differs from idiom to idiom. The more idiomatic a phrase becomes, the more different the relation is between idioms and non-idioms.

Analysis of body part nouns and verbs used with them

For ease of comparison, I have examined the 'V+O' pattern idioms containing body part nouns in the four languages referred to. Limitations of space allow me to give only the top ten of each noun and

verb. The following table is made on the basis of the dictionaries (listed on the last page) containing approximately the same number of entries.

English		Japanese		French		German	
N	V	N	V	N	V	N	V
hand	give	me(eye)	ireru (put)	oeil	avoir	Hand	haben
head	make	te(hand)	kiru (cut)	main	faire	Auge	machen
eye	take	kokoro (mind)	toru (take)	tête	casser	Kopf	nehmen
mind	do	kuchi (mouth)	ageru (raise)	coeur	mettre	Nase	geben
breath	lose	iki (breath)	dasu (put out)	bras	donner	Mund	halten
heart	cut	mune (breast)	utsu (hit)	peau	lever	Ohr	lassen
leg	have	ashi (foot/leg)	tateru (set)	langue	prendre	Fuß	setzen
face	hold	mimi (ear)	tsukeru (attach)	oreille	montrer	Gesicht	schlagen
nose	keep	hana (nose)	hiku (pull)	jambe	ouvrir	Finger	stellen
foot	show	atama (head)	fumu (tread)	nez	baisser	Herz	ziehen

NB. The table shows the frequency of nouns and verbs separately and does not show any collocation of each pair (ex. hand-give).

Without going into details, I should like to make some important points.

It seems that there are two types of direction. One is the process from the central meaning to the peripheral, involving cultural differences among languages. The other is the presence of common properties in the 'image'³⁾ of body part nouns. I should like to elaborate on these statements, taking 'hand', 'eye' and 'foot' for example.

All the languages favour the use of 'hand'. The central meanings of 'hand' common to the languages are: firstly, 'the act of catching', secondly, 'production by hand', thirdly, 'the direction/side of hand', and fourthly, the metonymic use of hand. From these meanings the following derivative meanings are produced: 'possession/control/influence', 'skill/handwriting', 'near sources' and 'help/labour'. The idioms corresponding to these meanings are: 'lay hands on', 'change hands/take in hand', 'a dab hand', 'at hand' and 'give/lend a hand to'.

'Eye' is particularly favoured in Japanese, French and German, and to a less extent in English. The common meaning is 'insight/judgment'. Other meanings

such as 'point of view' and 'attention/supervision' cannot be found in all the languages. The application of 'eye' to something resembling 'eye' is culture-specific and is most varied in Japanese. The first meaning is shown in all the languages as follows:

- (1) me ga aru
- (2) have a good eye
- (3) avoir de bons yeux
- (4) ein scharfes Auge haben

Lastly I will touch on 'foot'. Except in Japanese, English, French and German often use 'foot-leg', 'pied-jambe' and 'Fuß-Bein' pairs. In English, 'foot' is more often used in the abstract sense, often with no article. In French, both are used as objects of 'avoir', but it seems that 'jambe' is more often used in the literal sense than 'pied'. In German, both 'Fuß' and 'Bein' are used frequently as in

- (1) Er steckt noch die [Fuße, ?Beine]
unter seines Vaters Tisch.

'Foot', 'pied', 'Fuß' and 'ashi' (足) are on the ground, and the languages have similar idiomatic expressions referring to stability, and the other pairs cannot be substituted for them:

- (1) Ashi (足) (*脚) ga chi ni tsuku
- (2) keep one's feet (*legs) on the ground
- (3) prendre pied (*jambe)
- (4) Fuß (*Bein) fassen

I have no space to discuss the verbs in the table.

A look at the table will convince us of the verbs which constitute a definite set common to all the languages, such as 'give', 'have', 'make' and 'take'. This fact is significant in view of human cognition. These verbs belong to the natural class which is most frequently used and is grasped as reflecting our experiential activities as human beings.⁴⁾ Seen in this light, the set of verbs which constitutes idioms fits human cognition naturally, and therefore is predicted to be present in other languages as well.

Extended uses of body part noun idioms

In the light of cognitive semantics, Lakoff (1987: Ch.17) discusses the process of metaphoricalization on the basis of 'image-schema', and proposes the following factors:

- (1) Containment
- (2) Journey and its component parts
- (3) Proximity and distance
- (4) Linkage and separation
- (5) Front-back orientation
- (6) Part-whole relation
- (7) Linear order
- (8) Up-down orientation

(9) Mass vs. multiplex conceptualizations

The factors given above can be applied to idiomatization to a less extent. For example, (1) 'flip one's lid', (2) 'hit the trail', (3) 'give a wide berth', (4) 'part company with', (5) 'nod one's head' (positive meaning) and 'turn one's back on' (negative meaning), (8) 'warm up vs. calm down', (9) 'take objection' vs. 'make objections'.

Considering the number of idioms, the factors mentioned above seem not to accommodate all idiom phenomena. While the problem of what other factors should be included is one to be investigated in the future, the types of human emotions are interrelated with those of Lakoff's and are worth exploring.

Emotional expressions and idioms

Wierzbicka (1992: 119) gives the following as basic emotions of human beings: (1) interest, (2) joy, (3) surprise, (4) sadness, (5) anger, (6) disgust, (7) contempt, (8) fear, (9) shame/shyness, (10) guilt.⁵⁾

One interesting question is to what extent idiom expressions correspond to these emotions. If such emotions, as mentioned above, should be common among human beings, it follows that idioms which express these emotions should be abundantly found as well. Examining the idioms in the dictionaries consulted, I have found the following facts.

In English, idioms expressing 'anger' are the most numerous of the idioms I have examined. Examples are: 'raise the roof', 'throw a fit', 'stamp one's foot', 'lose one's temper', 'raise one's knuckles', 'hit the ceiling' and 'blow one's top'.⁶⁾

Although not mentioned in the above list, idioms expressing 'giveaway' are abundant. Examples are: 'spill the beans', 'let the cat out of the bag', 'give the show away', 'blow the gaff', 'have a big mouth' and 'tell tales'.

Idioms expressing 'bragging' are also numerous. Examples are: 'shoot a line', 'draw the longbow', 'blow one's own trumpet', 'blow[toot] one's own horn' and 'sing one's own praises'.

As idioms expressing 'shame/shyness', the following are some examples: 'lose face', 'lose credit', 'lose caste', 'keep one's distance', 'take a back seat', 'hide one's face' and 'avoid the limelight'.

These categories are the most numerous in my data. The others are too few to deserve special mention. Another interesting point of the classification of emotions is that English has a lot of idioms expressing 'difficulties' with the pattern 'preposition+(a/the)+noun'. Examples are: 'in a (tight) corner',

'up the creek', 'in a hole', 'on the hook', 'in[into] a jam', 'in a mess', 'up the pole', 'in[into] a scrape', 'in the soup', 'in a spot', 'on the spot', 'in trouble', and 'in deep water(s)'. These idioms show stative meanings. When other aspectual meanings need to be shown, verbs such as 'get' and 'put' are used as follows:

- (1) get into a jam
- (2) get into a scrape
- (3) put ... in the soup
- (4) put ... in a spot

These aspectual problems have some connections with idiom expressions which have different stages more or less corresponding to the aspect; i.e. the beginning, the process and the end. The following is an example showing these stages (cf. Gibbs (1990: 444):

<u>get into a temper</u>	-	<u>in a temper</u>	-	<u>showed temper</u>
beginning		process		end

I have not at present investigated this problem in detail, leaving the solution for future research.

In Japanese, idioms expressing 'anger' are most numerous. I shall not give examples except to say that the expression undergoes the process of 'from down to top' (for example, *atama ni kuru* (literally, come to one's head), 'from close to open' (for example, *manajiri o kessuru* (literally, open one's eyes), and 'from sleep to awake' (for example, *kanshaku o okosu* (literally, raise temper). The next numerous idioms show the category of 'surprise', and then categories of 'contempt/shame', 'deceit', and 'disappointment/sadness' in that order.

French and German have numerous idioms expressing 'anger'. Examples are: 'avoir la tête près du bonnet', 'avoir la tête chaude', 'échauffer les oreilles à', 'perdre la tête', 'montrer la tête; 'Adern/Hals schwellen', 'Blut zu Kopf steigen', 'die Faust schütteln/in der Tasche ballen', 'die Galle überlaufen/hochkommen', 'der Kragen platzen'. They also have idioms expressing 'surprise'. Examples are: 'ouvrir des yeux ronds', 'faire[ouvrir] des yeux comme des soucoupes', 'avoir les sangs tournés'; 'ein betroffenes Gesicht machen', 'große Augen machen', 'die Augen aus dem Kopf fallen', 'Mund und Nase offen stehen', 'mit den Ohren schlackern', 'jemandem bleibt das Herz stehen'. French has idioms expressing 'hunger' (symbol of civilization?): 'avoir le ventre creux', 'avoir la dent', 'avoir l'estomac creux', 'avoir l'estomac dans les talons' and 'ouvrir l'estomac'.

I have not been able to discuss this interesting problem extensively in this paper mainly because of

the scarcity of cross-linguistic data, but I believe that I have drawn your attention to some aspects wholly ignored up to now.

Conclusion

By means of English, Japanese, French and German as examples, I have emphasised the validity and necessity of typological studies of idioms. Particular attention has been paid to body part noun idioms, because they are regarded as universally in existence, mostly in the form of 'V+O' patterns.

While we recognise some universal or general properties of idiom formation, we should distinguish what is universal and what is culture-specific in idiomaticity areas. For this purpose, grammatical and semantic analyses only are not enough to shed any light on idiom structure. Non-decipherment and misunderstanding of some phrases and expressions often take place in conversation particularly between native speakers and non-native speakers. More investigation of cognitive and pragmatic factors will certainly be needed for the clarification of the process of idiom formation and usage.

In this paper I have confined myself to the synchronic side of language. But diachronic studies of idioms contribute much to an understanding of the present state of idiomaticity. As the following OED citations show, the body part noun 'foot' was used more literally, and has come to be used more idiomatically in the course of time.

- (1) 1542 UDALL, Erasm. Apoph. 46 It was a foule shame for a phylosophier to set his foote into any hous where bawderie were kepte.
- (2) 1719 DE Foe Crusoe II.vi, I was never to set my foot off this island.
- (3) 1875 T.W.HIGGINSON US.Hist. v.38 Columbus was not the first to set foot on the mainland.

Phenomena of this kind may be accounted for as processes of 'grammaticalization' (cf. Traugott and Hopper 1993) which has attracted much attention in recent years. In this sense, idiomaticity can be said to be the crossroads where both synchronicity and diachronicity meet.

NOTES

* I am grateful to Dr William Gater and Professor Leonhard Lipka for reading and commenting on an earlier version of the present paper, and to Professor Lipka and Professor Sylvie Gillet for acting as German and French informants respectively.

1) It seems that 'head' and 'heart' are frequently used as emphasizers, such as 'eat one's head off', 'laugh[cry, shout] one's head off', 'work one's head off'; 'cry one's heart out', 'eat[tear] one's heart out', 'sing one's heart out', 'sob one's heart out'. Part of the reason for their high frequency is that 'head' and 'heart' are the most important parts of the human body and therefore are useful as emphasizers.

2) Their explanation (79) "... spatial terms such as BEHIND can be derived metaphorically from a body part (an example of the shift from OBJECT>SPACE ...)" is not clear to me.

3) In cognitive linguistics, such terms as 'schema' (Langacker 1987: 371), and 'image schema' (Lakoff 1987 and Johnson 1992) have been used. These concepts are regarded as universal in view of categorization and cognitive processes. My use of 'image' refers more or less to this characterization.

4) Cf. Dixon (1982: 121) states: "... the nuclear/non-nuclear distinction is not just an arbitrary categorization, imposed on the language by the linguist for descriptive efficiency. It is, rather, 'psychologically real' (in Sapir's sense): speakers' minds work in terms of nuclear verbs, each of which has a number of specific non-nuclear derivatives."

5) Miller and Johnson-Laird (1976: 670-4) discuss some basic emotional feelings in relation to causal verbs:

feel	{	like, love, desire
	{	fear
	{	hate
cause to feel	{	comfort
	{	please, amuse
	{	interest, attract
	{	surprise, shock
	{	shame, disgust
	{	trouble, anger
	{	wound, pain

6) Gibbs (1990) discusses 'anger idioms' in detail on the basis of 'cognitive mental image'.

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VII

DISCOURSE ANALYSIS

AN APPROACH TO STYLE AND THE ORGANIZATION OF DISCOURSE

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For the past several years I have worked on a variety of texts, both spoken and written, using Communication Linguistics' 'phasal analysis'. The formal analyses are based on Halliday's systemic model primarily. Phonological, graphological, morphosyntactic, and semological analyses reflect both the authors' generic situation: experiential, personal, medium and functional relationships, and their communicator's communicating context: temporal, geographical and social provenances.

Analyses have revealed that as language users spontaneously and unconsciously encode language in order to communicate, they do so in 'chunks' of registerial consistency which we have called 'phases'. Sometimes the ideational, interpersonal and textual selections that characterize one phase change abruptly to form another; sometimes they change more gradually revealing 'transitions' between phases. Sometimes the combination of codal resources captured in the descriptive construct called phase are isolated; other times they develop and evolve, sometimes almost predictably, from one phase to another forming continuous blocks of related phases; other times one phase ends, only to reappear later in the discourse forming discontinuous phasal strings (see Malcolm 1985).

That the sequence of phases captures, then, larger discoursal organizational patterns has made it a particularly useful analytical tool for texts of extended discourse. Today, my intention is to summarize some of the organizational intricacies that several analyses have revealed. The first passage selected for its phasal transparency is a transcription of a conversation between two six year old children playing lego. The second compares this to the obscure complexity and variation of phases and phasal strings describing adult talk. The third passage shows how various Canadian authors have adapted conversations' organizing alternatives to dialogue. And the fourth example of phasal analysis

reveals the very artful way Eugene O'Neill constructs his dramatic dialogue.

When I say the phases which organize the children's spontaneous discourse are virtually transparent, I mean that phasal analysis reveals what is quite obvious.

- P.1 C - oh no I need another too I got it I got some too
 J - don't say you got some too
 C - now we'll use you now what colour should we use? there's only one more colour black
 J - yellow yellow's a gooder colour
 C - no the yellow goes on top
 J - oh yeah the yellow goes on top
 C - bye bye door oh no where's the black?
 J - can you see black? here's black
 C - keep your eyes on your mind no like that
- P.2 C - Jacqui Facway Facface
 J - Christopher quigger
 C - that's better
 J - Christopher Kwardy
 C - who is he? the mailman?
 J - your name is Christopher Karaway
 C - 1 2
 J - Lorne Carr calls pajamas 'paganmas'

In this transcription of Jacqui and Chris' talk it's easy to see how phase one and two are distinct. The participants of phase one are primarily first and second person pronouns; those of phase two are primarily third person proper nouns. A mixture of action, mental and relational processes describe the events of phase one; whereas, relational processes predominate in phase two. Place is manifested as a circumstance in phase one, not two. The syntax of phase one is more dependent on traditionally defined sentences than that of phase two. And phase two highlights sound play in a way that phase one does not. A conceptual set of 'colour' dominates phase one, a 'name' set phase two. Experientially, then, the phases are quite distinct; however, interpersonal and textual information also supports phasal boundaries. In the Lego talk of phase one the children command and question each other more than in the language play of phase two. And the cohesive power of situational nominal ellipsis and reference is important to phase one, as well as lexical repetition which characterizes both (Malcolm, 1984). So the phases are tri-functionally unique.

The six year old talk was quite sophisticated in terms of variety and complexity, although this passage does not amply exemplify this; however, the kids showed

a preference for the most basic codal resources, and they seemed little inclined to make their discourse internally cohesive. Their sentences were seldom more than six words in length; their utterances seldom more than a single sentence, and their phases averaged five turns. Their phases were extremely consistent as the kids repeated words, and seemed to opt for the same process and circumstance again and again, rather than vary them. And transitions, other than the formulaic 'd'ya know what?' were lacking. The phases were isolated for the most part: once the kids had touched on an event they seldom returned to the same combination of stylistic alternatives elsewhere.

Phases capturing adults' 'chunking' tendencies were not transparent: internal variation, complex and lengthy sentences, and longer phases obscured phasal boundaries. Only indepth analysis and frequency counts showed how their discourse was unconsciously organized as the following conversation between adult friends, Jay and Ralph, illustrates.

P.1 J - he's got like see downstairs he's got the front room he has these files 17 or 18 he decided one day to put all the files on the floor and he's never picked them up again and like it's paper strewn all over this one room and the next one the back room is a two kitchens in the house and he has not thrown away one of the cat food tins that he's opened up so there's all these empty catfood tins everywhere

R - (interrupts) sounds like a slum

T-OUT

In the first phase the landlord is the sole participant, as Jay builds a case of negligence against him, which he has begun earlier, by recounting further episodes that exemplify his slovenliness: failing to clean up dropped files and empty catfood tins. Past tense and completed aspect further specify the action and relational processes. Time is important beyond the verb group also, as is place. Jay resorts to additive links to hold his story loosely, casually, together. Ralph reaches the conclusion 'sounds like a slum' for a transition out (T-OUT) of these phasal selections.

Phase two describes a question period concerning Jay's personal living space with first and third person participants, relational processes, place circumstances, variation in mood, lexical collocation and additive links.

- P.2 J - it is except for the top floor where we live
it's all right
- R - so does he have like a living room where you
guys can go to or do you have to stay in your
own room? like when I phoned I was going oh
maybe he's downstairs uhm
- J - no all there is is a kitchen and one of the
girls have a kitchen table and there's four
chairs around it and that's the only thing we
have in the house

The next four utterances could almost be considered a separate phase with action processes and hypothetical modalities, but because of its limited size it is described as a transition out of phase two and into phase three. Phase three introduces a new character: the roommate who wants a cat. And the phase that captures the search for one is predictably involved with action, unpredictably with verbalization as a function of the narrative stance. Relational processes and a variety of circumstances fill in some descriptive detail. And lexical relations as well as conjunctions bind the text together.

- R - is there a fireplace in the place? T-OUT, T-IN
- J - yeah but it doesn't work cause it's too dirty
place would blow up or whatever
- R - oh geez I'd kill for a fireplace
- J - oh yeah but he's never fixed it up or anything
it's just like it's a mess the cats eat well
enough though lots of mice and stuff
- P.3 R - so what's with this cats anyway? someone told
me that you're smuggling in more than one or
two
- J - my roommate wanted a cat or one of them did eh?
one of the girls and she was bugging me to
drive her to the humane society cause she
cause she didn't have a car so I took her
there and there was one I liked so I picked it
out for myself but then she met this friend
about a week later an acquaintance of hers
whose cat had kittens so she got a kitten
right? ...

This example shows the complexity and variation in adult discourse, but not the 'organization' phasal analysis captures. When adult friends are talking, it appears that they may return to the same combination of tri-functional choices off and on in discontinuous phasal strings. Adult strangers, who have not shared prior linguistic and non-linguistic experiences, are more

likely to organize their conversation in very complete isolated phases, like children, or to develop safe generic topics in gradually evolving continuous phasal strings (Malcolm, 1985).

My analyses of conversation provided a natural comparison for its literary counterpart: dialogue. I was curious to discover to what extent writers: Kroetsch, Watson, Laurence, MacLennan, and Atwood wrote in isolated, continuous or discontinuous phases. Was the fictional relationship between character interlocutors more like the conversation of friends or strangers? It turned out that only the innovative Kroetsch risked discontinuous phases: the organizational pattern my data associates with adult friends. The others were much more conservative: isolated phases characterized their dialogue, reminiscent of stranger talk where orderliness and completeness were prerequisite. In these passages transitions led readers from one pattern of consistency to the next gradually. This was particularly true of authors like Atwood whose dialogue was the most complex and varied of the group. Otherwise, the fictional character's talk often seemed more childlike in its simplicity and internal consistency (Malcolm, 1991).

The following passage is from Kroetsch's Badlands.

- P.1 "Goddamned goldeyes.
They were coming down like hailstones.
P.2 Could have broke my back."
I thought you were looking at the sky," Tune said.
"Threw myself down in that grave to protect Anna."
P.3 "Come on Web," Tune said.
P.4 "You've been chewing locoweed."
"Goddamned Chinaman, it's the only thing he hasn't
fed us."
"Something hit you on the head," Tune said.
P.5 Dawe saying nothing.
P.1 And Web: "It was raining fish all around us;
goddamned goldeyes coming down all around us,
bouncing around, slapping and leaping up there and
the water coming down by the bucketful; and then we
were rolling uphill."
P.3 "Come on," Tune said. ...

In this brief passage the tri-functional combinations described by phases one and three each return beginning to form interweaving discontinuous phasal strings. Actually, had I included more of the passage more of the same phenomenon would become evident: some phasal consistencies emerged but once, others formed additional interweaving discontinuous strings. One phasal consistency was barely established before another began,

or returned. In a chat with a friend we come back to the same topics, carrying with them similar tri-functional manifestations, again and again. Kroetsch has mirrored this tendency in his dialogue.

The other authors whose dialogue I analyzed as part of the same project were more cautious. Watson's phases in the short story "Brother Oedipus" were distinct, but had enough in common to make transitions unnecessary.

- P.1 "You have been drinking," said our mother.
 "He needs an outlet for his emotions," said Puss's wife.
 "I have asked him to return to the church--a church I don't care which.
 He can choose which he likes and I will go with him.
- P.2 That's his trouble."
 "His trouble is that I spoiled him." said our mother.
 "He was a bright boy.
 I was strict as I knew how to be, but was not strict enough--or too strict as the books would tell me now."

Laurence's phases in The Stone Angel were even simpler than Watson's with sentences only a few words long, and phases a few sentences.

- P.1 "Mother--come on."
 A voice, and a hand shaking my shoulder.
 Startled, I drew away.
- P.2 "Eh? What is it?" T-IN
 "It's time," Doris says, with forced patience.
 "Come on, now."
 "Mercy, it can't be time to get up yet, can it?"
 "To get up!" she whinnies.
 "It's dinner time, not morning."

Although I've only included a brief segment of what was analyzed, Laurence's phases were isolated like Watson's, but here transitions in and sometimes out prepared readers for what was next.

That both encoders participated equally in most phases contributed to a certain consistency, unlike MacLennan's phases in which the disparity between interlocutor power made for more varied phases (Two Solitudes).

The priest looked about the room and Athanese T-IN offered him a chair.

- P.1 "I didn't come here to speak of Marius, Mr. Tallard.

I came to speak of you."

Athanese knocked the dead ashes from his pipe. T-OUT

"Well?"

T-IN

P.2 "I've been talking to Trembley.

And some of the other farmers whose land you propose to take away."

"Well?"

T-OUT

This greater variation may account for the frequent transitions both in and out of phase, as the reader is directed through a plethora of detail.

With sentences even more complex than MacLennan's, and just as varied, Atwood's text also evolved cautiously, as the transitions suggest (Surfacing).

"Don't you want to see it?" I asked.

T-IN

"I mean, the house and all."

P.1 "I must admit that I've already seen it; we've had our eye on this piece for quite some time.

I've been coming up here for fish for years and I've taken the liberty, when no one seemed to be here, of having a stroll around."

"He gave a small harumph, a voyeur of good social standing caught in the act; then he named a price that meant I could forget about Quebec Folk Tales and children's books and everything else, at least for a while. T-OUT

It was often shifts in mood, narrative mode, or speaker which signalled a shift in tri-functional selections, a shift in reader's expectations: a new phase.

In each of these passages the phases describing the dialogue: their variation and complexity, isolation or discontinuity, have much to say not only about character and relationships between characters in the 'fictional' world, but also with the authors' relationships to their respective audience or readers in the 'real' world. Much dialogue resembles children's talk, with short simple sentences, quite consistent and short phases. The more complex, the longer, and the more varied the dialogue, the more authors seem to resort to using transitions to ease readers from one set of phasal consistencies to the next. And the most demanding dialogue, demanding on the reader that is, is the one most like the casual conversation of friends, ebbing and flowing with interweaving discontinuous phasal strings.

And lastly, phasal analysis has contributed to my appreciation of the intrinsic organizing of O'Neill's dramatic dialogue. In the dozen passages I have analyzed thus far, the phases describing climactic passages in both O'Neill's early and later works disclose a very

intricate internal patterning. Two phases from "Mourning Becomes Electra" exemplify my point (Malcolm, 1992).

Why do you keep following me everywhere -- T-IN
and stare at me like that?

P.1 I had been a good wife to him for twenty-three years - until I met Adam. I was guilty then, I admit. But I repented and put him out of my life. I would have been a good wife again as long as your father had lived. After all, Vinnie, I am your mother. I brought you into the world. You ought to have some feelings for me.

Don't stare like that! T-OUT

The first phase has a descriptive or relational focus, with first and last sentences acting as transitional, or non-declarative mental process of perception, 'frames' into a phase that is predicationally varied, to which time is important, 'kinship' lexis, lexical collocation and first, second and third person chains of identity referring to Christine, Lavinia and Manon.

The second phase is even more complex, but has a narrative or action focus. It interacts with the actor or participant's non-verbal expressions, as Christine's fears that Lavinia has found the poison, alleged 'medicine', container are confirmed. The first and last two sentences act as a cognitive, interrogative frame to the rest: "What are you thinking?" (T-IN) and "Isn't that it? Isn't that what you've been planning the last two days?" (T-OUT). And then, phase two is more delicately divided into sub-phase one and two:

P.2.1' Surely you can't still have that insane suspicion - that I - (Then guiltily.) What did you do the night after I fainted? - I've missed something - some medicine I take to put me to sleep - (Something like a grim smile of satisfaction forms on Lavinia's lips. Christine exclaims, frightened:) Oh, did you find it?

Sub-phase one of phase two in turn is framed by the mental or relational, negative, 'insane' and 'suspicions' patterns characteristic of the first sentence and the latter two independent clauses of the last sentence. Otherwise, the action oriented sub-phase one is distinct from sub-phase two primarily on experiential basis: participants, mental processes.

P.2.2' Blake knows he died of -! (Then angrily.) I know what you've been waiting for - to tell Orin your lies and get him to go to the police! You don't

dare do that on your own responsibility - but if you can make Orin -

The framing of chunks of tri-functional consistency with transitions in and out, often involving shifts in mood, made for particularly well-structured passages. And although such a framing of consistencies was not typical of many of O'Neill's phases, it was surprising how often it characterized the more emotionally charged monologues. My work also suggests that the interweaving themes which give the plays a very coherent texture may be more a function of discontinuous phasal consistencies, than mere inter-sentential cohesive devices tying antecedents to referents. Dramatic dialogue, then, with its greater impetus to create a realistic facsimile of conversation than prose dialogue, would seem to take more 'organizational' risks than its prose counterpart. Or perhaps it is the greater length of the passages of dramatic dialogue that permits it, or demands it, given its potential for 'real' 'saying' in performance.

In conclusion, my analyses of both children's and adult's conversation have shed light on my current hypotheses concerning prose and dramatic dialogue. The complexity and variety of these literary styles has interesting implications to make concerning authors' relationships to their readers particularly. However, it is the analysis of the passages' phases which has intrigued me the most. Dramatic dialogue's occasional transitional frames, might almost be considered discontinuous phases, were the analysis delicate enough. And the importance of transitions, or lack of them, in prose dialogue, and the isolated nature of most of the phases involved seem useful in revealing how author's create whole new fictional worlds with great complexity, but, at the same time, in a way where they are simultaneously acknowledging and accomodating the reader's lack of shared experience in a very careful, albeit unconscious, 'organizing' of the dialogue.

The point is that by using a sentence-oriented framework of stylistic description, none of this would have become apparent. The descriptive methodology of Communication Linguistics called phasal analysis reveals a natural and spontaneous 'organizing' that is dynamic, 'as it happens' so to speak. And yet it is so logical, given the incredible complexity of language behaviour, that there be something larger than the sentence which serves to pull different kinds of information: phonological, graphological, morphosyntactic, and semological together into a meaningful whole which can be decoded with comparative ease. A whole that evolves and changes, gradually sometimes, abruptly others; with time,

following the changes in interlocutors' experiential, interpersonal, functional and medium relationships. A whole that facilitates the amazing process of language encoding and decoding. A whole, that analysis can and does reveal using 'phase'.

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THE DISCOURSE FUNCTIONS OF ENGLISH LEFT-DISLOCATION

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1. INTRODUCTION. Among the very few articles which deal with the structure of left-dislocation in English discourse² (Givon 1983; Gundel 1975; Prince 1984; and Rodman 1974), only Creider's "On the Explanation of Transformations" (1979) discusses in passing its discourse functions with respect to the succeeding context.

Creider believes that a topicalized left-dislocated constituent in an utterance often does not retain its topicality in the succeeding utterance. Thus, he claims that its function "is to serve as a 'bridging topic'" (1979:6) for the succeeding utterance so that the latter will have a new topic.

Creider, however, does not identify the circumstances under which a left-dislocated constituent displays the function of topic-bridging in discourse. And he provides only one example in his discussion, which is insufficient to support his claim.

This paper investigates the discourse functions of English left-dislocation in 44 examples from "Working" by Terkel (1974) and "The Muncie Black English Project"³ (1980). The analysis shows that bridging a topic in discourse is only a minor function of left-dislocation: the data demonstrate strongly that an NP topicalized by left-dislocation has as its main discourse function the maintenance of its topicality in the succeeding utterances. It is concluded that besides non-linguistic factors, the reference structure of the NPs and their grammatical relations in an utterance containing a left-dislocated constituent play a crucial role in determining whether the left-dislocation performs a topic-continuity function or a topic-bridging function with respect to the succeeding utterances.

2. DISCUSSION. To facilitate discussion, I will designate the left-dislocated NP the **Left-Dislocated Constituent (LDC)**; I will refer to what follows an LDC as the **Main Clause**; the whole sentence (LDC + main clause) will be called the **Utterance with an LDC (ULDC)**; and finally the utterance which follows the ULDC will be called the **Succeeding Utterance (SU)**.

Creider claims that left-dislocation is one of the many ways of topicalizing an NP as in (1) (1979:5):

- (1) "Griselda, I hope to meet her husband someday."

According to Creider, "Griselda," is a topicalized LDC. He then claims that a topicalized LDC often fails to maintain its topicality in the SU (1979:6) as in the following example:

- (2) "Griselda, I hope to meet her husband someday.
*She's a very interesting person."

In the SU, the NP "she," is the topic which refers to "Griselda," a topicalized LDC in the main clause. This topic continuity from a ULDC to an SU makes the discourse sound infelicitous because, according to Creider, the LDC should serve as a bridge to a new topic in the SU. He illustrates this topic-bridging function in (3) (1979:6).

- (3) A: "What do you find exciting about Griselda?"
B: "Griselda, I hope to meet her husband someday.
He's a very interesting person."

Creider's claim about the topic-bridging function of left-dislocation seems to be relevant here. Through an examination of my data, however, it appears that bridging a topic in discourse is only a minor function of left-dislocation, since most examples demonstrate that an NP topicalized by left-dislocation usually maintains its topicality in the SU.

2.1. The examination of the data reveals several different kinds of reference structures and grammatical relations of the NPs in the ULDCs. This section concentrates on the kind which occurs most frequently (41 of 44). The reference structures and grammatical relations are as follows:

LDC_i, SUB_i V.I. SUB(SU)_i.

- (4) A: "Do you think black people have pride today?"
B: "No, I really don't. It used to be. Boys and girls, women and men, they went out to try to see how decent and how respectable they could act. Now they go out to see how slouchy they can go, even going to school." (MBEP)

LDC_i, SUB_i V.T. DIR.OBJ_i/INDIR.OBJ_i. SUB(SU)_i

- (5) Q: "Do you think this (=young black people were ashamed of their race or their color) is so today?"

A: "In some portion. Now there is two things that stick out strongly in my mind. Now negroes, they had a gift from God all their life. They had the best voices. They could sing the best and do anything else the best...." (MBEP)

LDC_i, SUB_i BE PREDICATIVE. SUB(SU)_i

- (6) "What happened was my job was overloaded. I got cut and it got infected. I got blood poisoning. The drill broke. I took it to the foreman's desk. I says, 'Change this as soon as you can.' We were running specials for XL hoods. I told him I wasn't a repair man. That's how the conflict began. I says, 'If you want, take me to the Green House.' Which is a superintendent's office--disciplinary station. This is when he says, 'Guys like you I'd like to see in the parking lot.'

One foreman I know, he's about the youngest out here. He has this idea: I'm it and if you don't like it, you know what you can do. Anything this other foreman says, he usually overrides. Even in some cases, the foremen don't get along. They're pretty hard to live with, even with each other." (Terkel:223)

LDC_i, SUB_i COMPLEMENT_j. SUB(SU)_j COMPLEMENT_j. SUB(SU)_i

- (7) "The work I'm doin' now, sewers, water mains, and such as that---dirt work---there's no chance of hurting anybody. If I was doing the same work as before, set irons, such as that, there's a chance somebody could be killed. Your hands and feet, the pairs of them, have to work together.

You take other crafts, like an ironworker, he needs a belt, two spud wrenches, a knife which costs him fifteen dollars, and he makes more than a crane operator. The crane operator, he's responsible for a machine that cost over a quarter of a million dollars. Regardless of what kind of machine it is, they all cost anywhere from thirty-five, forty thousand dollars and up. So why isn't he worth as much money?" (Terkel:53)

In (4), (5), and (6), none of the NPs, if any, in the main clause, except the subject, is coreferential with the LDC, and the subjects in the SUs are also coreferential with the LDC. The topic evoked by the LDC, therefore, continues in the SUs. This shows that when the subject of the main clause is coreferential with the LDC, it is very likely that the subjects of the SUs will be coreferential with the subject in the

main clause. As a result, the topic evoked by the LDC in the main clause continues in the SUs.

The difference of (7) from the previous examples is that "they," the subject of the SU immediately following the main clause, does not refer to the subject of the main clause "he." Instead, it refers to "machines," the object of the preposition in the main clause. This makes the object of the preposition in the main clause and the subject of the SU immediately following the main clause to be coreferential. From this example, there seems to be a shift of topic from the one evoked by the LDC in the main clause to a different one in the SU immediately following the main clause evoked by the object of the preposition.

If we only consider the utterance with an LDC and its immediately succeeding utterance as in (7), it seems that an LDC serves the topic-bridging function in the manner described by Creider, although the reference structure is not the same. If we consider the following discourse, however, we can see that the topic evoked by the LDC continues: the topic "crane operator" evoked by the LDC changes to "they (= machines)" in the SU immediately following the main clause, and then it changes back to "he (= crane operator)" in the next utterance.

When we consider the discourse function of the SU immediately following the main clause in this regard, we may agree that it serves the function of providing additional information about or describing further the content in the ULDC. Therefore, when the subject of the main clause is coreferential with the LDC, the shift of the topic in the SU immediately following the ULDC is not likely to interrupt the topic evoked by the LDC in terms of discourse, and instead, it may make the topic evoked by the LDC more prominent.

According to Givon (1984:139), "the subject case tends to code the most important, recurrent, continuous topic" and the subject takes the highest position in his topic hierarchy (1983:22), these examples have well demonstrated his point.

2.1.1. Based on the analysis of the above data, we may propose a generalization regarding the topic-continuity function of left-dislocation:

When only the subject of the ULDC is coreferential with the LDC, there is a strong likelihood that the topic which is evoked by the LDC will continue in the SUs. However, if the SU immediately following the ULDC has a new topic which is not evoked by the LDC, thus, not coreferential with the subject of the ULDC, but

relates to an entity being already evoked in the ULDC, this new topic is likely to be only on the sentence level and does not affect the topic evoked by the LDC on the discourse level.

2.2. Now let's look at a different kind of reference structure (3 of 44):

LDC_i, SUB_j / V.T. DIR. OBJ_i. \ SUB(SU)_i
 \ V. PREP. OBJ_i. /

- (8) "I make a pretty good buck. I figure if I do my work and do it honestly I should be entitled to whatever I make. For high-rise buildings, head man makes a thousand dollars a month and his apartment. You never heard of that stuff before. I've turned down high rises by the dozens. I can make more money on the side on walkup buildings.

Most tenants, I get along with 'em. The bad part about a tenant, they have no respect for your hours. Maybe my day starts when their day starts, but they want something done when they come home. My day is ending too." (Terkel:174)

It is obvious that the reference structure of (8) is different from previous examples: an NP, other than the subject of the main clause becomes coreferential with the LDC. This seems to contradict the topic hierarchy offered by Givon (1984) in which the agent case precedes all other cases in terms of topic continuity. However, since we are not dealing with a linguistic phenomenon in general here, but only left-dislocation in English, we may realize that not only the grammatical relations, but also the coreferentiality between the LDC and the NPs in the main clause play a crucial part in determining the topic-continuity in discourse. In this example, although the agent "I" is the topic in the main clause, it seems to be not as informatively prominent as the NP which is coreferential with the LDC in the main clause, since the NP, although neither the agent nor the topic in the main clause, becomes the topic in the SUs. As a result, the topic evoked by the LDC continues in the discourse. We may propose a generalization to account for this kind of utterance:

When the subject of the main clause is not coreferential with the LDC, the NP in the main clause which is coreferential with the LDC is likely to be also coreferential with the subjects

of the SUs, and, thus, the topic evoked by the LDC continues in the discourse.

2.3. Among my data I cannot find a single case which has the same reference structure and grammatical relation as the example given by Creider. In his example there is no NP in the main clause coreferential with the LDC. Some linguists have argued that left-dislocation does not always require the coreferentiality of the NP in the main clause with the LDC. Rodman (1974:447) has this example:

- (9) "Restaurants, the situation's hopeless in Chapel Hill."

Unfortunately, none of the examples given by these linguists are provided with both the preceding and the succeeding contexts. According to Prince (1984:217), "67% of the LDs in the Terkel corpus involve the full main subject of the S...7% of the LDs in the Terkel corpus involve a full sentence-final NP." This shows that in discourse it is much more common to have NPs in the main clause coreferential with the LDC than not.

It seems from Creider's example that when there is no NP in the main clause coreferential with the LDC, any NP in the SU, as long as it has been already evoked but not coreferential with the LDC, can become the topic. However, it is only partially true if we look at the following examples:

- (10) A: "What do you find exciting about Griselda?"
 B: "Griselda, I hope to meet her husband someday. She always talks about him in class."
 (11) A: "What do you find exciting about Griselda?"
 B: "Griselda, I hope to meet her husband someday. I've learned he's an astronaut."
 (12) A: "What do you find exciting about Griselda?"
 B: "Griselda, I hope to meet her husband someday. He's a very interesting person."

Although (10) has the similar reference structure of (2) offered by Creider, it is felicitous because the content of the SU is about the content in the main clause. But (2) is not acceptable because "She's a very interesting person" is not related to any content in the main clause. The similarity in the reference structure among (10), (11) and (12) is that none of the NPs in the main clause is coreferential with the LDC. The difference is that each subject of the SU has a different reference. Most important, they are all

acceptable.

This different coreferentiality of the subject in the SU with the NP in the main clause indicates that which NP will become the new topic of the SU depends on what is more salient and what the focus is in the speaker's mind. We may propose the following generalization:

Any NP including the LDC, depending on the saliency and focus in the speaker's mind, may become the subject of the SU as long as the content of the SU is about what has already been evoked in the main clause.

2.4. Based on the analysis and discussion of the data, we have noticed some constraints on topic-bridging performed by an LDC in discourse as follows: only when none of the NPs including the subject of the main clause is coreferential with the LDC, and neither is the subject of the SU, may the LDC serve as a bridging topic.

Considering the constraints, we may rephrase the generalizations as follows:

- (A) When the subject of the main clause is coreferential with the LDC, there is a strong likelihood that the topic which is evoked by the LDC will continue in the SUs. If, however, the SU immediately following the main clause has a topic different from the one evoked by the LDC, it is very likely to be additional information about an entity being evoked in the main clause, and this new topic is very likely to be only on the sentence level and does not affect the topic on the discourse level, and the topic already evoked by the LDC is likely to be resumed in following SUs.
- (B) When an NP in the main clause other than the subject is coreferential with the LDC, it is very likely that the topic evoked by the LDC will continue in the SUs.
- (C) When neither the subject nor any of the NPs in the main clause is coreferential with the LDC, any NP including the LDC, depending on the saliency and focus in the speaker's mind, may become the topic of the SUs as long as it has already been evoked in the main clause.
- (D) Only under the circumstance of (C), the SU is likely to have a new topic which may be on the discourse level.

3. CONCLUSION. In this paper, three kinds of reference structures and grammatical relations represented by utterances containing an LDC and their succeeding utterances have been specified and analyzed. Three reference constraints and four generalizations regarding the functions of topic-continuity and topic-bridging performed by left-dislocation in English discourse have been suggested.

It is concluded that the main discourse function of an LDC is to maintain its topicality in the succeeding utterances. Whether left-dislocation serves as the function of topic-continuity or the function of topic-bridging in discourse depends mainly on the reference structure in the main clause. In other words, in terms of discourse, left-dislocation itself does not determine whether it will be the topic of the SUs, it is rather determined by the topicality of the NP coreferential with the LDC in the main clause. In a real life conversation, apart from the linguistic reasons, non-linguistic ones also influence whether a topic evoked by an LDC continues or not in discourse, such as the saliency and the focus in the speakers' mind, their attentiveness in the conversation, whether they have the desire to dominate the conversation (Rodman, 1974:464), whether they are physically tired, and whether they feel pleasant or sensitive about the established topic of the conversation.

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² The available discussions concerning left-dislocation concentrate mainly on: (1) the different syntactic characteristics of an utterance containing a left-dislocated constituent (Gundel 1975, Rodman 1974); (2) the functions an LDC plays within an utterance (Givon 1983, Gundel 1975, Prince 1984, Ross 1967); and (3) the differences between topicalization and left-dislocation (Creider 1979, Gundel 1975, Prince 1984). Only Prince (1984) and Rodman (1974) have discussed, among other things, the functions of left-dislocation with respect to the previous context.

³ Among 44 examples, 18 are from "Working" by Terkel (1974) and 26 from "The Muncie Black English Project" (1980). Both "Working" and "MBEP" are records of oral English. I chose them as my data source because left-dislocation can be found almost only in oral English. Although some of my examples are chosen from "MBEP," I don't think that English left-dislocation is a dialectal phenomenon and behaves differently between

African-American English vernaculars and White English vernaculars.

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SNAPSHOTS OF FOREGROUND EVENTS

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1. INTRODUCTION. The distinction between foreground and background information in the analysis of discourse remains a mystery, or at best, a half-solved puzzle. While there is agreement about the intuitive concepts represented by the terms foreground and background, the linguistic coding devices used to mark them remain elusive, and the methods of identifying foreground in narratives are diverse. It is generally agreed, however, that foreground information is the important, salient, central information that is essential to the narrative, while background information adds detail to the story but is not essential to the story line.

This study investigates four potential coding devices using two methods of identifying foreground. Three of these factors, taken from Hopper and Thompson (1980), are related to the notion of transitivity and are binary in nature. According to Hopper and Thompson (1980), high transitivity features (e.g., two or more participants, affirmatives and telic aspect) code foreground information, while low transitivity features (e.g., one participant, negatives and atelic aspect) code background information. They add that foreground is marked more by the combination of several high transitivity features than it is by the presence or absence of any one factor (Hopper & Thompson 1980 pp. 283-284). The fourth factor to be examined in this study is clause type. Tomlin (1985) presented data that suggest that foreground is coded by main clauses, while background is coded by subordinate clauses. Later experimental studies (e.g., Prideaux & Stanford 1990; Tjosvold 1989) have not produced results that clearly support either claim, while the validity of the transitivity hypothesis has been questioned on theoretical and empirical grounds (Rice 1987). Despite the lack of clear experimental validation of these theories, they remain the most promising indications of the foreground - background distinction.

Potential confounding factors from previous studies have been addressed in the present study. Foreground information is identified independently from the subjects' discourse through the use of a separate task and a control experiment, while event line foreground was verified by four judges working independently. In past experiments, the use of aspect may have been related to the degree of transitivity of the event shown on the film clip that subjects were asked to describe (cf. Prideaux & Stanford 1990; Tjosvold 1989). The nature of the event being described in the present study was controlled through the use of twelve drawings depicting three levels of transitive events.

2. METHOD. Three experiments were performed using the same stimuli of thirteen drawings taken from children's story books: five depicting high transitivity events (completed, punctual actions (Hopper & Thompson 1980)), six depicting low transitivity events (durative, continuous actions (Hopper & Thompson 1980)), one depicting an intransitive event, and one distracter picture showing a potential action. The distracter picture was shown first and functioned as a practice run, followed by the remaining twelve pictures which were randomly

ordered. This randomly assigned presentation order was constant for all subjects and through all three experiments. The data from the first distracter picture was ignored in the analyses of all three experiments.

In the first experiment, 24 subjects identified the "most important or salient event or thing in the picture" in as few words as possible. Then, they wrote two or more sentences describing the picture. In the second experiment, nine subjects told stories orally about the characters and events shown in each of the thirteen pictures. When they had done this, they identified the main or important event or thing in each picture using as few words as possible. The third experiment was designed to establish independent judgments of the foreground. As before, 35 subjects were asked to identify the main or important event or thing in each picture in as few words as possible.

For the description task, foreground information was operationally defined as the events mentioned by more than 50% of the 68 subjects from all three experiments in their task of identifying the most important event shown in the picture. Background information was therefore operationally defined as anything that was not foreground. In the rare cases where the subject's identification of the foreground differed from the majority, the foreground for that subject included the majority decision of the foreground, as well as the subject's unusual decision of the foreground.

The stories were analyzed using event line as a definition of foreground; this event line always included what the subjects had identified as important, and was determined as the main, essential events in each story, which were independently identified by four judges. When two or more judges chose the same event, it was considered foreground; otherwise, it was analyzed as background. When all four judges agreed, the events were usually the same as the events that had been identified as important for the description task. Of the foreground events, only 23% were identified by all four judges, but of the background events, all four judges ignored 74% (that is, did not include these events as main events).

As mentioned earlier, only four factors were examined in the present study: clause type, number of participants, aspect, and affirmation. In addition, the number of high transitivity features that were used for each clause were noted, as advocated by Hopper and Thompson (1980). The data were analyzed clause by clause, but this analysis was restricted to tensed clauses that could be clearly categorized as telic or atelic. The working definitions of telic and atelic aspect are as follows: telic aspect includes perfects, passives, and simple past tense; atelic aspect includes progressives and present tense as well as the durative use of the verbs *be* and *had*, as in *she was frightened* and *the frog had a very long tongue*. Otherwise, dependent clauses were identified in accordance with Tomlin (1985), and number of participants was determined in accordance with Hopper and Thompson (1980, p. 284). Finally, negatives were operationally defined as clauses that include any form of *never*, *not* or *no*.

3. RESULTS. Chi Square analyses ($df = 1$) were performed on the use of each factor with foreground and with background information. Table 1 below shows that foreground information was described with two or more participants at statistically significant levels ($p < .001$ for nine transitive pictures, $p < .01$ for one low transitive picture) for all transitive events except *reading*. This reflects the fact that the verb *read* can be transitive or intransitive, with half of the subjects using the verb transitively, and the other half using it intransitively. Foreground information of the intransitive event occurred with one participant ($p < .001$). Background information was described with one participant at statistically

significant levels for all transitive events except *kick*, a high transitive event, and *banana*, the intransitive event.

Table 1 Descriptions - Number of Participants^a

Event	Picture	Foreground		Chi Square df = 1	Background		Chi Square df = 1
		2	1		2	1	
high T	soup	21	0	21.000***	23	40	4.587*
	kick	18	0	18.000***	39	34	.342 ns
	hippos	18	2	12.800***	16	68	32.190***
	frog	21	2	15.696***	16	37	8.321**
	octopus	21	0	21.000***	26	80	27.509***
low T	cereal	31	0	31.000***	25	46	6.211*
	laundry	20	0	20.000***	13	57	27.657***
	alligator	19	0	19.000***	29	50	5.582*
	caveman	18	3	10.714**	18	51	15.783***
	sled	19	1	16.200***	23	77	29.160***
	reading	10	7	.529 ns	34	67	10.782**
intransitive	banana	0	22	22.000***	31	47	3.282 ns

^a For Table 1 and all subsequent tables, the levels of significance are coded as follows:

- *** p < .001
- ** p < .01
- * p < .05
- ns p > .05 (not significant)

In the storytelling task, foreground information tended to occur with two participants (see Table 2 below), but these results were statistically significant for only two low transitive events ($p < .05$). Background clauses tended to have one participant, statistically significant for seven of the twelve pictures. The results for the intransitive event were insignificant for both foreground and background. Thus, the effectiveness of number of participants as a coding device for distinguishing foreground and background information seems to be dependent upon the transitivity of the event, and upon the task (description or story).

Table 2 Stories - Number of Participants

Event	Picture	Foreground		Chi Square df = 1	Background		Chi Square df = 1
		2	1		2	1	
high T	soup	21	15	1.000 ns	21	32	2.283 ns
	kick	28	17	2.689 ns	27	47	5.405*
	hippos	25	16	1.976 ns	47	67	3.509 ns
	frog	25	19	.818 ns	32	63	10.116**
	octopus	33	42	1.080 ns	64	101	8.297**
low T	cereal	26	23	.184 ns	30	33	.143 ns
	laundry	22	26	.333 ns	33	47	2.450 ns
	alligator	25	24	.020 ns	41	72	8.504**
	caveman	19	18	.027 ns	23	43	6.061*
	sled	36	19	5.255*	52	92	11.111**
	reading	24	12	4.000*	55	78	3.977*
intransitive	banana	18	29	2.574 ns	21	32	2.283 ns

The second transitivity factor was affirmation. Affirmative clauses were used for all events, for both foreground and background, and in both the description and storytelling tasks, at highly significant levels ($p < .001$ for every event). When negatives were used in the descriptions, they were always with background information. In the storytelling task, there were negative clauses in both the foreground and background: 8% of all negatives occurred in the foreground, and 92% of the negatives were in the background. The prediction that foreground is coded by affirmatives while background is coded by negatives is not supported, while Hopper and Thompson's (1980) results of 100% of negatives in background information is repeated only by the data from the descriptions task.

The final transitivity factor is aspect. For the description task (data are presented in Table 3 below), atelic aspect was used to describe background information ($p < .001$ for eleven events), and foreground information for events low in transitivity ($p < .001$ for five low transitive events). The only time telic aspect was significant ($p < .001$) was for foreground information describing one high transitive event (*octopus*) and the intransitive event. While this partly supports the suggestion that high transitivity events are more likely to be coded with telic aspect than low transitivity events, it does not support the predictions that foreground is marked with telic aspect and background is marked with atelic aspect, since the majority of foreground clauses were coded with atelic aspect.

Table 3 Descriptions - Aspect

Event	Picture	Foreground		Chi Square df = 1	Background		Chi Square df = 1
		telic	atelic		telic	atelic	
high T	soup	8	13	1.190 ns	13	50	21.730***
	kick	3	15	8.000**	22	51	11.521**
	hippos	6	14	3.200 ns	8	76	55.048***
	frog	15	8	2.130 ns	4	49	38.208***
	octopus	19	2	13.762***	23	83	33.962***
low T	cereal	14	17	.290 ns	10	61	36.634***
	laundry	0	20	20.000***	4	66	54.914***
	alligator	0	19	19.000***	9	70	47.101***
	caveman	0	21	21.000***	3	66	57.522***
	sled	0	20	20.000***	11	89	60.840***
	reading	0	17	17.000***	5	96	81.990***
intransitive	banana	19	3	11.636***	24	54	11.538***

However, this prediction is generally supported by the data from the storytelling task, given in Table 4 below. Telic structures were used to code foreground information (significant for seven of the twelve pictures), and atelic structures were used to code background information (also significant for seven of the twelve pictures, but not always the same seven as the foreground results). There was no difference between the high transitive event types and the low transitive event types, contrary to the results for the description task above: atelic aspect was not preferred for foreground information.

Table 4 Stories - Aspect

Event	Picture	Foreground		Chi Square df = 1	Background		Chi Square df = 1
		telic	atelic		telic	atelic	
high T	soup	27	9	9.000**	19	34	4.245*
	kick	35	10	13.889***	35	39	.216 ns
	hippos	24	17	1.195 ns	34	80	18.561***
	frog	27	17	2.273 ns	29	66	14.411***
	octopus	50	25	8.333**	60	105	12.273***
low T	cereal	34	15	7.367**	34	29	.397 ns
	laundry	25	23	.083 ns	45	35	1.250 ns
	alligator	31	18	3.449 ns	41	72	8.504**
	caveman	22	15	1.324 ns	17	49	15.515***
	sled	42	13	15.291***	62	82	2.778 ns
	reading	26	10	7.111**	47	86	11.436**
intransitive	banana	34	13	9.383**	28	25	.170 ns

Before continuing on to the clause type factor, let us look at the number of high transitivity features that were used for each clause. As discussed above, Hopper and Thompson (1980) predict that foreground information will occur with more high transitivity features than background information. These high transitivity features are two or more participants, affirmatives, and telic aspect; since the affirmation factor was not statistically significant alone in distinguishing foreground from background, it was not included in the analyses presented below. The number of high transitivity features (two participants and telic aspect, with a possible range from zero to two high transitivity features per clause) used in each tensed clause was tabulated, and these data are summarized in Tables 5 and 6 below. These tables compare the distribution shapes of number of high transitivity features for foreground and background information.

Table 5 presents the results for the description task. The distribution of number of high transitivity features is significantly different for foreground and background information, with the majority of high transitivity features grouped at one or two per clause for foreground information, and at zero or one per clause for background information. The only non-significant picture is *reading*, where one or two high transitivity features tended to be used for both foreground and background: number of participants in the foreground was not significant for this picture, probably because the verb *read* can be transitive or intransitive, as mentioned above. For most of the low transitivity pictures, foreground was never marked with two high transitivity features (since atelic aspect was preferred for these pictures), while background for these same pictures sometimes occurred with two high transitivity features, contrary to the prediction that foreground should be marked with more high transitivity features than background.

The storytelling results are presented in Table 6 below. For *cereal*, *laundry* and *banana*, the distribution shapes for foreground and background were not significantly different: that is, clauses with zero, one, and two high transitivity features were used with equal frequency for both foreground and background. For the remaining nine pictures, foreground clauses tended to contain one or two high transitivity features, while background clauses tended to contain zero or one high transitivity feature more often than two.

Table 5 Descriptions: Distribution of Number of High Transitivity Features (two participants and telic aspect)

Event	Picture	Foreground			Background			Chi Square df = 2
		0	1	2	0	1	2	
high T	soup	0	13	8	34	22	7	20.51***
	kick	0	15	3	28	29	16	12.77**
	hippos	1	14	5	62	20	2	35.12***
	frog	2	6	15	34	18	1	41.29***
	octopus	0	2	19	72	19	15	53.15***
low T	cereal	0	17	14	45	17	9	35.93***
	laundry	0	20	0	56	11	3	48.94***
	alligator	0	19	0	48	24	7	30.15***
	caveman	3	18	0	50	17	2	25.31***
	sled	1	19	0	75	16	9	50.36***
	reading	7	10	0	64	35	2	3.76 ns
intransitive	banana	3	19	0	35	31	12	15.25***

Table 6 Stories: Distribution of Number of High Transitivity Features (two participants and telic aspect)

Event	Picture	Foreground			Background			Chi Square df = 2
		0	1	2	0	1	2	
high T	soup	5	14	17	24	18	11	11.40**
	kick	6	13	26	34	18	22	14.54***
	hippos	7	19	15	56	36	22	13.25**
	frog	8	19	17	52	25	18	16.64***
	octopus	22	23	30	78	50	37	9.69**
low T	cereal	11	16	22	24	14	25	3.46 ns
	laundry	15	19	14	31	22	27	2.03 ns
	alligator	10	22	17	55	34	24	11.42**
	caveman	10	13	14	35	22	9	9.91**
	sled	8	16	31	64	45	35	22.23***
	reading	5	12	19	61	41	31	15.79***
intransitive	banana	13	16	18	16	25	12	3.14 ns

The final factor examined in this study was clause type. These results were very similar to the affirmation factor results: main clauses were used significantly more often than subordinate clauses for both foreground ($p < .001$ for eight pictures, $p < .01$ for two pictures, and $p < .05$ for two pictures) and background information ($p < .001$ for all pictures except *cereal* which was insignificant) in the description task; and in the storytelling task, main clauses were preferred for both foreground and background information (significant at $p < .001$ for all events but *caveman* for foreground; significant at $p < .001$ for four pictures, $p < .01$ for five pictures and insignificant for three pictures (*soup*, *caveman* and *banana*) for background). When the distribution of all subordinate clauses is calculated, subordinate clauses occur significantly more often in background information than in foreground information for descriptions (Table 7) and for stories (Table 8).

Table 7 Descriptions - Distribution of Subordinate Clauses

Event	Picture	Number of Subordinate Clauses in Foreground		Number of Subordinate Clauses in Background		Chi Square df = 1
high T	soup	1	(6%)	17	(94%)	14.222***
	kick	1	(5%)	19	(95%)	16.200***
	hippos	1	(9%)	10	(91%)	7.364***
	frog	2	(20%)	8	(80%)	3.600 ns
	octopus	6	(23%)	19	(76%)	6.760**
low T	cereal	1	(3%)	29	(97%)	26.133***
	laundry	4	(25%)	12	(75%)	4.000*
	alligator	0	(0%)	14	(100%)	14.000***
	caveman	2	(12.5%)	14	(87.5%)	9.000**
	sled	1	(5%)	20	(95%)	17.190***
	reading	3	(14%)	18	(86%)	10.714**
intransitive	banana	6	(29%)	15	(71%)	3.857*

Table 8 Stories - Distribution of Subordinate Clauses

Event	Picture	Number of Subordinate Clauses in Foreground		Number of Subordinate Clauses in Background		Chi Square df = 1
high T	soup	6	(23%)	20	(77%)	7.538**
	kick	5	(18%)	23	(82%)	11.571***
	hippos	7	(20%)	28	(80%)	12.600***
	frog	7	(17.5%)	33	(82.5%)	16.900***
	octopus	6	(15%)	33	(85%)	18.692***
low T	cereal	7	(27%)	19	(73%)	5.538*
	laundry	5	(16%)	27	(84%)	15.125***
	alligator	6	(15%)	33	(85%)	18.692***
	caveman	13	(30%)	31	(70%)	7.364**
	sled	8	(17%)	38	(83%)	19.565***
	reading	3	(6%)	49	(94%)	40.692***
intransitive	banana	7	(24%)	22	(76%)	7.759**

Finally, when the proportion of subordinate clauses in foreground and background information is compared, the proportions are significantly different for only three events (one high and two low) in the description task, and for eight events (four high, three low and the intransitive event) in the storytelling task, with subordinate clauses occurring proportionately more often with background information than with foreground information. These three analyses suggest that subordinate clauses have some relation with background information, but like the affirmation factor, on their own they are not reliable in distinguishing foreground from background.

4. DISCUSSION AND CONCLUSION. No single factor stands out as a clear coding device for the foreground - background distinction. Neither affirmation nor clause type, alone, is effective since both foreground and background were coded with affirmatives and main clauses significantly more often than with negatives and

subordinate clauses. Although Tomlin's (1985) results (dependent clauses code background information) were largely confirmed by the present study, so were the results of Prideaux and Stanford (1990), who found that both foreground and background are coded with main clauses. The approach that one takes in the analysis of the data therefore has a profound effect upon the conclusions that one can draw. This conflict in the clause type data (main clauses occur with background information more often than subordinate clauses do, but a higher proportion of subordinate clauses tend to occur in the background than in the foreground) coincides with Fleischman's (1985) observation that recent research had found a stronger correlation between main clauses and foreground than between subordinate clauses and background, which Fleischman suggested might be evidence that background may not be psychologically real. The similarities between affirmation and clause type are striking; if one is looking for a single factor that distinguishes foreground from background, one would have to conclude that neither affirmation nor clause type accomplishes this task. However, if these two factors are grouped with several others, perhaps the cluster of factors may together identify background information, at least as a statistical correlation.

The two remaining transitivity factors, number of participants and aspect, seem to work in tandem: on average, foreground is marked with either or both high transitivity features (two or more participants and/or telic aspect) more often than background is. This is, however, a statistical trend rather than a reliable marker (as Chvany, 1984 also found): if a clause contains two participants and uses telic aspect, it is more likely to be foreground than background information, but it would be impossible to use these criteria to identify foreground in discourse. In addition, the effectiveness of this pair of factors as markers of foreground is probably limited to transitive events, since an intransitive event will only have one participant in the clause describing it. It is simplistic to assume that all events worthy of being foreground information will be transitive events, so alternative factors should be investigated.

Hopper and Thompson's (1980) claim is supported by this study: clusters of high transitivity features do seem to be correlated to foreground information. Perhaps the size of the cluster can be expanded through the investigation of alternative factors, such as those in the hierarchies of Rice (1987), Chvany (1984, 1985), Wårvik (1990), Wallace (1982) and Weber (1983). In addition to clusters of factors that mark foreground information, potential clusters coding background information (including negatives and subordinate clauses) should be investigated.

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THE GIVEN-NEW STRATEGY REVISITED: EVIDENCE FROM MANDARIN AND ENGLISH

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1. INTRODUCTION.¹

The last two decades have seen a tremendous upsurge in work in research dealing with the nature of information distribution and its syntactic coding in discourse. Halliday's (1967) 'given-new' distinction has been elaborated and further developed in cognitive and discourse terms by, e.g., Clark and Haviland (1977), Chafe (1987), Prince (1981b), Brown and Yule (1983), and many others. One important insight deriving from this work is that in the unmarked case for English and many other languages, given information, that which is shared by the speaker and hearer, typically precedes new, that which the speaker imparts to the hearer.

In an early discussion of the given-new strategy, Clark and Haviland (1977) argue that speakers and hearers share an implicit agreement of cooperation in the use of given and new information. They formulate this 'given-new contract' as follows:

Try to construct the given and the new information of each utterance in context (a) so that the listener is able to compute from memory the unique antecedent that was intended for the given information, and (b) so that he will not already have the new information attached to that antecedent (1977: 9).

In other words, given information serves as a link connecting the previous (shared) knowledge in memory to the new information. From this perspective, it is natural to assume that given information should be delivered by the speaker earlier than new, since the given information constitutes an address to which new information can be attached. In support of this view, Clark and Haviland (1977) provide both linguistic and psychological evidence to show that the given-new strategy facilitates comprehension. Similar evidence has been offered for such diverse languages as Japanese, Korean, and Ukrainian (e.g., Abraham 1991, Ariel 1985, Prince 1981, Prideaux & Baker 1986, Prideaux & Yoshida 1988, Takahara, 1978).

Recently, however, Givón (1989) has challenged this claim, arguing that the given-new distinction should give way to a notion of relative importance, where highly important information is placed first in sentences. On the basis of Payne's (1987) Papago data, Givón argues that less predictable (i.e., new) information tends to be placed earlier, with more predictable information placed later. The arguments are complex, and it is not at all clear that the Papago data do in fact support Givón's claim, since the crucial cases in those data are sentences with a single argument and with other constraints also operative in the determination of word order.

It is not the purpose of the present paper to deal with the details of the Papago data, however. Rather, we provide arguments in support of the more conventional formulation of the given-new strategy. We first examine its cognitive basis, showing that the psychological principles of primacy and recency determine positions of prominence in sentences which provide the natural loci for given and new information. We then provide empirical evidence from Mandarin Chinese and from English discourse to support the claim that in both of these languages, given information typically precedes new, a result which cannot be explained in Givón's terms. We conclude that the traditional view of the given-new principle, while perhaps in need of further refinement, is nevertheless the appropriate one to account for information distribution in discourse.

2. COGNITIVE BASIS FOR THE GIVEN-NEW STRATEGY. The well-documented psychological phenomena of primacy and recency play important roles for an understanding of the given-new strategy. Both initial and final positions in a sentence are special. The initial position provides the foundation of the mental structure being processed and it has a privileged position in the user's mental representation (Gernsbacher, 1989). Similarly, the final position also has a privileged position simply because of the short-term memory decay. That is, the information most recently heard is most available in the listener's active memory.

The importance of the initial and final positions within a sentence can be well illustrated by those syntactic constructions in English which yield marked structures. For example, passivization, topicalization, left dislocation, clefting, pseudo-clefting, and extraposition all involve the movement of an important element to either the initial or final position. Some examples are:

- (1) a. The big dog chased the little boy.
- b. The little boy was chased by the big dog.
- c. The big dog, he chased the little boy.
- d. It was the big dog that chased the little boy.
- e. What the big dog chased was the little boy.

Such structures reveal that it is not always the case that the given information *must* precede new. Factors such as focusing, foregrounding, and contrasting also enter the picture. However, when the given-new order is violated, highly marked structures and special intonation are always involved. In (1d), for example, what is given is that something chased the little boy, information which resides in the subordinate clause, while the new information the *big dog* takes a special sentence stress. Even here, of course, the new information is post-verbal. In (1e), the given information again is found in the subordinate wh-clause and the new information is final.

Nevertheless, for the typical unmarked structures, the tendency is to deliver the given information earlier and often in subordinate clauses, with the new information later (and typically in main clauses). The ordering of given before new makes good processing sense. For the speaker, given information serves as the jumping-off point, the mental space held common by both participants. Similarly,

for the hearer, the initial given information provides a frame of reference to which new information will be integrated. The tendency for given information to precede new seems to be almost universal, since over 80% of the world's languages are SOV or SVO, and definite NPs (given information) tend to serve as subjects and indefinite (new) NPs as objects.

In summary, we conclude that there is a firm cognitive basis for the given-new strategy, and while the specifics of the distribution of information will clearly interact with the morpho-syntactic properties of a given language, the expectation is that the strategy should have universal application, since it depends on aspects of our cognitive architecture and not just the peculiarities of the grammar of one or another language. Yet empirical evidence is required, and it is to two additional pieces of evidence that we now turn.

3. NEW EVIDENCE FROM MANDARIN. Since the given-new strategy is presumably cognitively based, it should be tied exclusively to English but should be reflected in other languages as well. In this section, we turn to an analysis of Mandarin and argue that both the basic word order and some of its variations can be accounted for by the given-new constraint.

A striking aspect of Mandarin sentence structure is that it contains a topic as well as the grammatical relations of subjects and objects (Li & Thompson, 1980). Basically the topic always comes first in the sentence, and always refers to something about which the speaker assumes the hearer has some knowledge (Li and Thompson, 1980: 18). That is, the topic is always given, as in (2) below:

- (2)a. *zhongguo di da wu bo.*
 China territory big resources abundant
 China is a big country with abundant resources.
- b. *zheke shu yezi da huar xiao.*
 this tree leaf big flower small
 This tree, (its) leaves are big but (its) flowers small.

In cases such as these, the topic, carrying important and given information, is obligatorily placed in sentence initial position, lending strong support for the given-new ordering.

There is much controversy about Mandarin word order, primarily because it appears to be governed by semantic and pragmatic rather than purely syntactic factors. Chao (1968) argues that the subject tends to come before the predicate (and therefore before the object) because the subject refers to something known to both the speaker and hearer. Consequently, the subject is typically definite and given, with the object typically indefinite and new, conforming in large part to Givón's (1979) observations along the same lines about English subjects and objects. This tendency is exemplified in (3), in which the subjects are definite and given and the objects indefinite and new.

- (3)a. *Li xiaojie qu kan dianying le*
 (name) miss go see movie ASP
 Miss Li went to see a movie.

- b. *ta pengjian pengyou le*
 he meet friend ASP
 He met a friend.

Although the general tendency is for the subject to be given and definite, it may also code new information. However, when this happens, it is typically post-verbal, in the position generally reserved for indefinite NPs coding new information, as represented in the contrast between (4a) and (4b).

- (4)a. *ke lai le*
 guest come ASP
 The guest(s) has/have come.
- b. *lai ke le*
 come guest ASP
 Some guest(s) has/have come.

In other words, the preverbal subject in (4a) is best interpreted as definite and given information, while the post-verbal subject in (4b) is indefinite and new, conveying information not known to the hearer at the time of the utterance. Sentences of this sort are very common in Mandarin. In (5a), for example, it is assumed that the hearer is aware of the thief, whereas in (5b), the thief is new information for the hearer.

- (5)a. *zei pao le*
 thief run ASP
 The thief escaped.
- b. *zuo wan wu li pao jin le yige zei*
 last night room in run in ASP a thief
 A thief came into the room last night.

In summary, the preverbal position of the subject NP tends to correlate with definiteness and givenness, and the post-verbal position with indefiniteness and newness. Much the same pattern can be found in object positions as well. Both pre- and post-verbal objects are found in Mandarin, with the pre-verbal position correlating with definiteness and givenness (6a, b) and the post-verbal position with indefiniteness and newness (6c).

- (6)a. *ta xin ji le.*
 he letter mail ASP
 He mailed the letter (letters).
- b. *xin ta ji le.*
 letter he mail ASP
 He mailed the letter (letters).
- c. *ta qu ji xin le*
 he go mail letter ASP
 He went to mail a letter (letters).

In (6b), not only is *xin* 'letter' understood as given, but it is also the topic of the sentence as well.

Finally, the correlation between word order and givenness in Mandarin is also found in the *ba* construction. In this construction, the (definite and generic) object is positioned before the verb and "what all *ba* noun phrases share is that they are understood to refer to something about which the speaker believes the hearer knows" (Li & Thompson, 1980: 465). That is, the *ba* NP is construed as given information, as in (7).

- (7) *ta ba xin ji le.*
 he letter mail ASP
 He mailed the letter (letters).

Moreover, when the predicate (verb plus object) consists of both given and new information, the *ba* construction serves to separate the given from the new by placing the given information before the new. This permits given information to be pre-verbal, and new post-verbal, as in (8).

- (8) *ta ba shu zhong zai yuanzi li*
 he tree plant at yard in
 He is planting the tree/s in the yard.

The predicate of (8) contains both given (*shu*) and new (*zhong zai yuanzili*) information. By placing the direct object with *ba* and postposing the locative phrase, the speaker adheres to the given-new constraint and provides the hearer with the standard canonical cues. The utility of the *ba* construction in separating given from new information can be further illustrated in (9).

- (9) *ta ba yier digei ta de na bei shui he le yiban*
 she (name) hand her PT that glass water drink ASP half
 She drank half of the glass of water that Yier handed to her.

The direct object is *yiban Yier digei ta de nabei shui* ('half of the glass of water that Yier handed to her'), although part of the direct object 'the glass of water that Yier handed to her' is given information, while the rest of object '(drank) half' is new. And it is the *ba* construction which permits the separation, with the placement of the given portion in a pre-verbal position and the new portion post-verbally.

This discussion reveals that Mandarin word order is tightly constrained by the given-new strategy. Here we find the prototypic case in which given information precedes new (topic before comment, given subject before new object, given object before new subject, etc.). Moreover, we find a special construction, the *ba* construction, which capitalizes on the given-new distinction, permitting alternative word orders depending on whether the object is given or new. In short, Mandarin provides considerable supporting evidence for the operation of the given-new strategy, adding further plausibility to the claim that this strategy is a product not of the grammar of a particular language, but rather a reflection of our processing limitation and constraints.

4. NEW EVIDENCE FROM ENGLISH. In the Mandarin data discussed above, attention was directed primarily to the informational status of NPs within main clauses. In the present section, however, we examine not only evidence from another language, namely English, but also another aspect of the given-new constraint, in particular, the claim (by, e.g., Bever 1970) that given information typically resides in subordinate clauses and new information in main clauses, as (1d) above. Such a claim is initially quite plausible, especially in light of the related claim that subordinate clauses (at least in declarative sentences) tend to code presupposed information. Moreover, the claim receives further plausibility if, with Haiman (1985a, b) and others, we come to find that languages are more iconic than we have heretofore believed. From the perspective of iconicity, it would not be surprising to find the more important (new) information coded in the more independent main clause, with the shared information found in a position of less prominence, namely in the subordinate clause.

However, such a claim about the information status of subordinate clauses must not be accepted too readily, given the fact that numerous different types of subordinate clauses exist, clauses with rather different structures and functions. Accordingly, it is important to test the general hypothesis about the information status of subordinate clauses by looking at different types of structures.

In order to test this version of the given-new hypothesis, an experiment was carried out in which participants (20 male and 20 female) were asked to watch a short film clip taken from the movie *Adam's Rib*, and then provide oral narrative descriptions of what they had seen. Each participant provided two narratives, one to a stranger and another to a friend. The resulting 80 narratives were taped and transcribed for later analysis.

While the narratives were analyzed in terms of a large number of factors, both syntactic and lexical, the focus of our attention here will be limited to two types of subordinate clauses, relative clauses (such as those in 10) and subordinate adverbial clauses (as in 11).

(10)a. She started humming along with the song that was playing on the radio.

b. She then picked up a bottle which contained some oil for massages.

(11)a. After he finished the massage, he slapped her on the bottom.

b. She kicked him in the shin after he came back into the room.

Information in a particular clause was scored as given if the content was previously mentioned (as in 10a, 11a), available pragmatically, or could be inferred. Otherwise the clause was treated as new (as in 10b, 11b). For the relative clauses, both the definiteness of the NP to which the clause was attached and the position of the relative clause within a sentence (medial or final) was tabulated. The definiteness of the host NP was important since it has been often suggested that definite NPs tend to code given information and indefinite ones new (e.g., Givón 1979). The position of the relative clause was tabulated in order to discover whether non-interrupting medial or final relative clauses tended to prevail. Some 162 relative clauses were found in the narratives, and their distribution are found in Table 1.

The results in Table 1 immediately refute the earlier version of the given-new hypothesis, since there are more new (115) than given (67) relative clauses in these narratives.

Position	<u>HOST NP</u>			
	<u>Definite</u>		<u>Indefinite</u>	
	Given	New	Given	New
Medial	16	2	0	9
Final	30	15	1	89

Table 1. Relative Clause Distributions

However, it is also clear here that there is a significant association of given relative clauses with definite host NPs and new relatives with indefinite hosts, a relation which is statistically highly significant ($\chi^2 = 96.9, p < .0001$). Moreover, while there is a residue of some 17 new relatives attached to definite NPs, these all turn out to be instances of structures discussed by Prince (1981a), in which the determiner is *this*, used in a specific but new sense, as in (12):

- (12) So they get into this heated argument about this ... um ...
court case in which the lady is involved in.

These results indicate that the given-new hypothesis as applied to relative clauses must be modified to take into account the fact that the relative clause tends to agree with its host NP in terms of givenness. It is also clear, however, that final relative clauses are by far the dominant ones, and most of these code new information, in accord with the general tendency for given information to precede new.

Not surprisingly, only a small number (38) of adverbial clauses with *before* or *after* were found in the narratives. Here again, of course, the subordinate clause can be either initial (as in 11a) or final (11b). The distribution of these adverbial clauses is represented in Table 2.

<u>Position</u>	<u>Given</u>	<u>New</u>
Initial	22	1
Final	1	14

Table 2. Adverbial Clause Distributions

Here again, it is clear that while there is no significant tendency for the adverbial clauses to contain given information, there is nevertheless a tendency for given adverbial clauses to precede new ones.

These oral English data provide new insight into the operation of the given-new strategy. A general tendency emerges for modifiers to agree in givenness with the elements which they modify (as the relative clauses do with their host NPs), and for given adverbials to precede new ones. However, these data do not support the earlier hypothesis that subordinate clauses tend to code given information. Clearly,

there are various other factors at work, factors which interact with the given-new information distribution constraint.

5. CONCLUSIONS. The evidence cited here from Mandarin provides further support for the potential universality of the given-new strategy within main clauses. Rather than being an artifact within a particular grammar or a peculiarity of a specific language, the given-new strategy appears to be very general in form. It seems to derive from constraints imposed by our cognitive architecture, and to be reinforced by pragmatic principles which facilitate communication. Furthermore, the principle of placing given information first serves a kind of iconic function, situating the hearer in such a way as to have available and activated an address in the evolving mental representation to which new information can be attached.

The English data presented above, however, reveal that caution is needed in taking the given-new strategy for granted. Clearly, the earlier view that subordinate clauses typically code given information is not borne out in these data. Rather, what is borne out is the general ordering of given before new, regardless of whether that information is contained within a main or subordinate clause. Moreover, a very natural 'givenness agreement' seems to hold between a host NP and its modifier.

In summary, we conclude that there is a firm cognitive basis for the given-new strategy as well as strong empirical support from a variety of languages. While the distribution of information is clearly coded by the morpho-syntactic properties of a particular language, the expectation is supported that the strategy has universal application, since it depends on aspects of our cognitive architecture and not just the peculiarities of the grammar of one or another language.

Notes

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VIII

HISTORICAL AND COMPARATIVE LINGUISTICS

CAN LANGUAGES "DISINTEGRATE"?

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The *American Collegiate Dictionary* (Random House, 1968) defines the word "disintegrate" as "to reduce to particles, fragments, or parts". By way of example, they cite the following: "Rocks are disintegrated by the rain." Rocks can indeed disintegrate; so can sand castles, books, and old clothes. But can *languages* disintegrate? Can they reduce to "particles" or "fragments"? If so, what do these "particles" and "fragments" consist of?

These questions are not as jejune as they might seem for a scholar specializing in Slavic historical linguistics, for the word "disintegrate" and its derivatives (Russian **распад**—) crop up in virtually all writings on Common (or Proto-) Slavic (hereafter CSI), the putative "parent language" from which all the modern Slavic languages allegedly developed. From the earliest years of the discipline, Slavists have been engaged in a rousing debate about "when CSI disintegrated", "what provoked this disintegration", etc. The concept appears early (see Antoine Meillet's seminal 1926 handbook¹) and often². So entrenched is it in this scholarly tradition that it figures even in the work of modern investigators who question many other old positions (cf. Xaburgaev 1980). Significantly, the "disintegration" of CSI is discussed at length in two recently-published books: Birnbaum 1979/85 (a massive, two-volume critical bibliography) and Carlton 1991 (an attempt at a comprehensive phonological history of Slavic). In the discussion that follows, we will focus primarily on these works, plus Birnbaum 1966.

The basic philosophy which underlies traditional treatments of Slavic linguistic development in fact allows for two distinct types of "disintegration", while operating under the following assumptions:

1. CSI in its early stages³ is a language without dialects, a "remarka-

bly homogeneous" language that remained free of geographical variation for as long as *4,000 years* (Carlton 1991: 94, emphasis mine; cf. also Birnbaum 1979/85 I: 8). 2. Early CSI remained in such a state for so long because the early Slavs skulked around an isolated, yet extremely compact homeland, cut off from neighbors, yet enjoying uninhibited communication with each other (Carlton 1991: 75). 3. Around the year 500 a. d., this pristine, unvariegated language began to develop major dialectal divisions for the first time, as the Slavs burst forth from their *Urheimat* and set out on the migrations that, over the course of the next two centuries, were to spread them over the entire eastern half of Europe (ibid.). This is "disintegration" in the first sense. 4. The era of CSI unity ends between the 10th and 13th centuries a. d. During this time, across the Slavic language area, two short, high-mid vowels drop in certain positions and fall together with more fully articulated vowels in others (this is the so-called "fall of the jers", and it will be treated in some detail below). This change affects all Slavic dialects, but produces different results in different areas, so that "... after the completion of this process ... we begin to speak of separate Slavic languages instead of dialects of [CSI]" (Carlton 1991: 76; also see Birnbaum 1966: 173). This is "disintegration" in the second sense.

These, then, are the presuppositions which have guided Slavic historical linguistics for the better part of a century. Are they sound ones? In the present paper, I will argue that indeed they are not: they represent an antiquated view of language that relies too heavily on the largely discredited *Stammbaum* theory of linguistic development, divorces the idiom under study from the people who speak it, and, in general, goes against the way natural languages actually behave in the field. Let us reconsider these four assumptions in this light, and try to lay the foundation for a radically different approach to the study of prehistoric Slavic.

A LANGUAGE WITHOUT DIALECTS SPOKEN IN A TINY HOMELAND, & "DIS-INTEGRATION" IN THE FIRST SENSE

As obviously intertwined as they are, these misconceptions need to be dealt with together. By contemporary standards, of course, the idea that a natural language could exist without dialectal divi-

sions--for some four millenia, no less!--is, *prima facie*, absolutely absurd. It is a holdover from an earlier time, when the *Stammbaum* theory held sway in Indo-European studies. As early as 1933, Leonard Bloomfield pointed out that the view of a homogenous parent language suddenly "disintegrating" into dialects was but a sequela of the comparative method, and had nothing to do with historical reality (Bloomfield 1933: 311-12). Meanwhile, Trubačev effectively demolishes the CSI version of this obsolete theory (Trubačev 1982 I: 12-13), while Birnbaum suggests indirectly that this illusion is bolstered by the simple fact that very early dialectal divisions in prehistoric Slavic are so difficult to recover (Birnbaum 1966: 155).

That is quite true, of course, but I would submit that we have not found many ancient isoglosses precisely because we have been conditioned to believe that they either do not exist or cannot be found. When we adopt a different attitude, intriguing possibilities immediately suggest themselves. For instance, I have studied the variation among several different third-person present-tense endings in Slavic, and have concluded that it could be the result of isoglosses that arose already in the Balto-Slavic period (Miller 1990, esp. pp. 19-30) 4

In considering phonological oppositions, many scholars have clearly been mesmerized by the phonemic basis of the comparative method, whereas more modern studies have fruitfully explored the possibility of old dialectal oppositions on the phonetic level. Xaburgaeв 1980, for example, sees ancient articulatory differences, *inter alia*, in the treatment of CSI *ě (194-97) and *tj/*dj (200). By contrast, Carlton 1991 treats these items as phonemes occupying the same position in all Slavic dialectal sound systems, and dates divergence in their development to a much later period (150-51, 142-43, respectively; cf. Birnbaum 1966: 163-64, 171-72, *et passim*). In this regard it is worth recalling Pavle Ivić's caveat that sometimes non-phonemic differences can be much more significant in dialectology than phonemic ones (Ivić 1962: 49-50).

Also obfuscating the issue is the traditional synchronic division of the Slavic languages into East, West, and South branches. Birnbaum 1966, for instance, is, on one level, a long, *a priori* historical justification for this classificatory scheme (see esp. 161). Com-

parisons that cut across these boundaries are potentially much more fruitful for the study of the CSI period, however. Thus Miller 1990 suggests a possible east : west split that cuts through South Slavic (also cf. discussion in Birnbaum 1966: 189-91). Some isoglosses raise the possibility of an old north : south division (Birnbaum 1966: 180). Birnbaum 1966 repeatedly brings up--then abruptly drops--NW : SE correspondences that suggest a central : peripheral opposition (168, 171-73, 195). Finally, adding Baltic to the mix reveals a truly fascinating set of correspondences between Baltic and South Slavic that could be investigated far more thoroughly than it has to date: see Miller 1990: 24, plus references; Miller 1991: 6-7. All of these possibilities suggest ancient dialect bundles in prehistoric Slavic--bundles that should be on our front line of research.

Once the myth of a homogeneous CSI is exploded, it no longer becomes necessary to search for a compact Slavic *Urheimat*. The problem of where the original Slavic homeland was is not a strictly linguistic issue, so I will not delve too deeply into it here. (Trubačev 1982 [10-12, *et passim*] dissects the traditional approaches to this subject, and offers some refreshing correctives of his own). However, the intimate connection between this question and the old *Stammbaum*-based theory of CSI homogeneity just discussed does raise an interesting point: is it possible to conceive of a speech area so small that the language in question cannot develop dialects? After all, Labov has studied variation on Martha's Vineyard, an island all of 109 sq. miles in area (Labov 1972). And consider this quote about 14th-cen. English: "Men of the east with men of the west, as it were under the same part of heaven, [sound more alike] than men of the north with men of the south: therefore it is that Mercia, that is, men of middle England, . . . understandeth better the end languages, northern and southern, than northern and southern understandeth each other" (Trevisa, 1387, quoted in Chambers & Trudgill 1980: 16). Fourteenth-century England, while considerably larger than Martha's Vineyard, was hardly a big country; nor is England noteworthy for its towering mountain ranges and unfordable rivers. In other words, we have in 1387 a small language area suffering no natural impediments to communication, yet characterized by considerable variation. Now, could the Slavic *Urheimat* have been smaller than Trevisa's England? Martha's Vineyard? Considering that, by the 9th century, the Slavs

had spread over literally half of Europe, from the Elbe to the Dnepr, from the Baltic to the Aegean, this suggestion would seem rather foolish. Wherever this putative home territory was, it had to have been fairly sizeable--and perforce criss-crossed by isoglosses.

Thus, the concept of a uniform CSI suddenly disintegrating into a welter of regional dialects has to be rejected out of hand as a scholarly anachronism. CSI isoglosses from before 500 a. d. may be difficult to recover, but they were there, and reorienting ourselves to this fact will help us find at least some of them. In any event, we have to face reality: early CSI did not, and could not, disintegrate--it was born disintegrated!

THE FALL OF THE JERS & THE BIRTH OF MODERN SLAVIC LANGUAGES

This brings us to the question of disintegration in the second sense: dialects of late CSI developing into the separate "daughter" languages. We have seen that both Birnbaum and Carlton view the so-called "fall of the jers" as the *terminus ad quem* of the CSI period, the phonological change that essentially turned CSI dialects into independent languages. This formulation raises two questions, one specific, one general: Was the fall of the jers so radical as to create new languages out of related dialects by itself? And, can we use linguistic criteria alone to determine when and where a dialect becomes a language in its own right?

Any relevant handbook will provide the reader with the details of this seminal sound change. Carlton 1991 (165-72) provides as good a traditional overview as any; the following sketch is based on this. The jers were the high-mid reflexes of IE short *i and *u. Scholars disagree about the particulars of their pronunciation, but by the tenth century, they must have been extremely short vowels of reduced quality, perhaps something along the lines of [i] and [u] respectively, only much shorter. In the process we call the "fall of the jers", which begins in SE Slavic in the tenth century, and finally ends in northern Russia in the 13th, "weak" jers are lost throughout Slavic, while "strong" jers fall together with more robust vowels in the system. ("Strong" jers were those standing in any syllable immediately to the left of another jer; all others were "weak".) There were complica-

tions in certain single-syllable roots, and when the *jer* was immediately preceded or followed by /j/, but the above formula by and large held throughout the by now vast Slavic language area.

The fall of the *jers* is traditionally referred to as the "last sound change of CSI" for a couple of reasons. First, in the words of Carlton 1991 (76), this was "the last . . . change to affect all [CSI] speakers": no subsequent linguistic process was to touch literally all Slavic dialects. Second, the "fall" ". . . set the various Slavic dialects on entirely new and different paths of development" (Carlton 1991: 166). That is, it altered the phonemic inventory of the dialects (e. g., it phonemicized palatalized consonants in East Slavic); changed the phonological shape of the Slavic word (for instance, closed syllables were now possible, as were any number of consonant clusters); and produced new relationships that were systematized differently in different regions (for instance, vowel-zero alternations in several single-syllable stems). Carlton 1991 (166ff.) summarizes these and other consequences of the "fall".

Alas, upon closer analysis, it becomes clear that the above points are largely irrelevant for deciding the issue at hand. In the first instance, the extent of a change's spread within a given language area may be of some interest, but it alone cannot determine whether a parent language has "disintegrated". Consider the quintessentially Canadian pronunciation of the diphthong in "about". This is the result of a geographically very restricted change, yet no one would ever argue that 1.) Canadian English is now an independent language, or 2.) English has thereby "disintegrated". Conversely, the universality of the fall of the *jers* within Slavic says nothing (in and of itself) about the status of individual Slavic dialects vis-a-vis each other.

More importantly, it is true that this change created a myriad of new phonological systems on Slavic territory, but this still begs the question of how significant, in the end, these differences are. Let us recall Pavle Ivić's dictum about systematic vs. surficial dialectal differences (see above) as we consider a hypothetical CSI sentence and its reflexes in three modern Slavic languages:

**Čьlověkъ je vъšьlъ vъ Bělъgardъ* "The man entered Belgrade." (NB:

in this example, following tradition, Cyrillic ѣ = IE short *i, while ѓ = IE short *u.) With the fall of the jers, and other changes, the same sentence would look like this in modern Russian, Serbian, and Slovene:

Rus Čilav'ék vašól v B'élgarat.

Sb Čòvek je Ůšao u Beògrad.

Sln Člòvek je wšðw* u Bėwgrat. (*hypothetical form)

These sentences are clearly different, but would they be unintelligible to speakers of the other languages? I would say not, and in any case, other sound changes have produced differences easily as significant as the fall of the jers (cf. the treatment of the cluster *-gard-; the differences in stress; Russian vowel reduction).

To put the fall of the jers further into perspective, I would suggest we record the sentence "Park the car in Harvard Yard" in any three varieties of English we could care to name--say, Scots dialect, working-class Bostonian, and rural Southern American. The results would probably differ as much as the sentences in our Slavic example, but that would not prevent us from viewing them as varieties of a single language--English.

The point is, linguistic differences alone cannot determine what is an independent language, and what is the dialect of a language. Chambers & Trudgill 1980 (5) state that "... a 'language' is not a particularly linguistic notion at all ..."; individual languages are set up "... for reasons that are as much political, geographical, historical, sociological and cultural as linguistic." For a concrete example, let us consider the South Slavic linguistic continuum, which extends from the Julian Alps, down the length of the Balkan peninsula, all the way to the Aegean and Black Seas. This continuum is officially divided into four languages: (from the NW) Slovene, Serbo-Croatian, Macedonian, and Bulgarian; however, Primorsko Slovene in NE Italy would be close to unintelligible to a speaker of Prekmursko Slovene in SW Hungary; the "SC" spoken in the Croatian capital of Zagreb sounds more like Slovene than the SC spoken in the Serbian capital of Belgrade; and Macedonian sounds to the uninitiated like a variety of western Bulgarian. No one who values his/her life, however, would dare suggest that the language boundaries be redrawn to

better reflect these linguistic realities! Similar observations could be made about all the linguistic continua in Europe (and elsewhere, as well).

We must conclude by accepting the point that the development of independent Slavic languages out of CSI dialects is as much a matter for the cultural historian as it is for the linguist. With this in mind, let us close by calling for greater cooperation with our colleagues in other disciplines: recent articles (see especially Trubačev 1982) demonstrate what progress in reconstructing a language's pre-history can be made when linguists coordinate their efforts with archeologists, historians, folklorists, and other specialists.

ENDNOTES

1. See, for instance, *inter alia*, p. 12 of the Russian translation, Meillet 1951.
2. Birnbaum 1966 refers to a plethora of works from various periods that treat this notion; his bibliographical section (159-61) mentions at least nine that have a derivative of the word "disintegration" (or some related root) in the title. This article itself contains copious discussion of the question of "when CSI disintegrated".
3. Some writers--unhelpfully, in my opinion--use the term "Proto-Slavic" to refer to early CSI: cf. Birnbaum 1966: 153-54.
4. Most traditional investigators assume--usually with no corroborating argumentation--that these oppositions date only to the early historical period; see, for example, Logar 1974: 106. Birnbaum 1966 raises the possibility of CSI isoglosses, only to reject it out of hand (181-83).

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JAPANESE AND KOREAN CORRESPONDENCE BETWEEN /d(t)/ AND /n/

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O Japanese doryoku (effort) is a loanword from Classical Chinese nol¹tek (id.) and so is Korean nolyek (id.). We can observe the same /d/-/n/ correspondence between Japanese dorei (slave) and Korean noyey (id.), both of which are borrowed from Classical Chinese nolei (id.).

The same correspondence is observed even among such Modern Korean loan words as nokata (navvy) and nokan (earthen pipe), both borrowed from Japanese dokata and dokan respectively (I Swung-nyeng, 1988, p.145).

Kim Sa-yep postulated that there are mutual /d(t)/ and /n/ correspondences initially as well as intervocally between Japanese and Korean (Showa 56, pp.373-4).

In this paper, we would like to prove firstly Kim Sa-yep's postulation that Japanese /d(t)/ in initial position corresponds to Korean /n/: secondly his contrary postulation that Japanese /n/ in initial position corresponds to Korean /t/; thirdly that the /t/-/n/ shift is found among the indigenous words within Japanese and Korean; and finally that initial /n/-dropping is not a unique phenomenon in Middle Korean but also observable in Japanese.

By proving Kim Sa-yep's postulation of mutual /t/-/n/ correspondences in initial position between Japanese and Korean, we can contribute to enlarging Martin's monumental phonetic correspondence laws between Japanese and Korean (Martin, 1966). This would hopefully increase the number of cognates between the two languages, presenting more proof for their close genetic relationship.

1 In order to prove Kim Sa-yep's postulation of Japanese initial /t/ and Korean /n/ correspondence, we will choose, out of Kim Sa-yep's list of corresponding words, only the words which may correspond, and examine if they exactly correspond by the use of Martin's laws. If they do not, we will apply Kim Sa-yep's laws, showing the same number he used for consonant correspondence laws in brackets, and the one for vowel correspondence laws in parentheses.

J ta (rice field) ~ MK non (id.) [11]-18a-[17]

J taka-si (high) ~ MK noph-(id.) [11]-18a-[33]-22

J tati (character) ~ MK nacAl (id.) [11]-17-9a-20d-12b

OJ tuki (tribute) ~ MK nak (id.) [11]-21-4a-15d

J tuduk-u (to continue) ~ MK nizwuy-(id.) [11]-(55)-14b-19a-5aa

J toku (to melt) ~ MK nuki-(id.) [11]-21c-4a-(34)

J tobu (to fly) ~ MK nAl-(id.) [11]-21bb-[66]-19c

With just seven cases of correspondence between Japanese /t/ in initial position and Korean /n/ in initial position, we cannot exclude the possibility of accidental correspondence. Therefore, in order to present a

stronger argument, we present more cases.

- OJ ta(who)~MK nwu(id.) [11]-18
 J tat-u(to rise)~MK nil-(id.) [11]-21dd-12
 J tate(lengthwise)~MK nAlh(id.) [11]-21d-12-5c-16b
 J tane(corn)~MK nat(id.) [11]-17-[21]-16b
 J tu(ferry)~MK tAl(id.) [11]-21-12b
 J -tu(piece)~MK -nach(id.) [11]-21-[55]
 J de-(to go out)~MK na-(id.) [11]-(36)
 J tefu(butterfly)~MK napu(id.) [11]-(36)-1-21aa
 J toshi(age)~MK nah(id.) [11]-21b-[57]-15d

As we have succeeded in presenting more than a dozen cases in all of correspondence between Japanese/d(t)/ and Korean /n/ in initial position, the postulation examined so far has been proven.

2 We are now to examine Kim Sa-yep's other postulation that Japanese initial /n/ corresponds to Korean /t/. And to do so, we will take the same procedure of choosing words out of Kim Sa-yep's list, and putting them to Martin's laws. And only in case of failure, we try testing them by Kim Sa-yep's corresponding laws.

- J nage-(to throw)~MK teti-(id.) [20]-17a-[18]-16a
 J nar-u(to become)~MK toy-(id.) [20]-18a-(77)
 J nir-u(to resemble)~MK tam-(id.) [20]-20d-[30]
 J nuk-u(to pierce)~MK turp-(id.) [20]-21aa-12d-[39]
 J nuri(coating)~MK thil(id.) [20]-(34)-11-15d
 OJ nopo-kiri(saw)~MK thop(id.) [20]-20-1a-22 + J -kiri(cutting)
 J nora(field)~MK tul(id.) [20]-21cc-11-23

Here again, in order to avoid the possibility of coincidence, we show more such cases.

- J nar-u-si(sweet)~MK tAl-(id.) [20]-21d-11-19c + J adj. ending-si
 J nori(measure)~MK tolay(girth) [20]-20-11-(17) cf. J uti-nori(inside measurement).
 J norosi(signal by raising smoke)~MK tul-(to raise) [20]-21c-11-22 + J suffix -si cf. J akasi-si(/-ri)(light)
 OJ ni-(to boil)~MK pti-(to steam) K pref. p+ [20]-15a
 OJ ni(dirt)~MK sta(earth) K pref. s+ [20]-20d
 OJ na-wi(earthquake)~MK sta(earth) K pref. s+ [20]-17 + J suffix-wi. cf. J proper names: Ishi-wi, Mura-wi, Muro-wi. etc.
 J nos-u(to iron)~MK tali-(id.) [20]-21b-14c-15e

As we have shown more than a dozen cases in all, we can claim safely that the postulation of the correspondence between the Japanese initial /n/ and Korean /t/ are proven.

3 The examinations we have so far carried out have proved Kim Sa-yep's postulations that there are mutual /t/-/n/ correspondences between Japanese and Korean at the initial positions.

These mutual /t/-/n/ correspondences will help us to excavate doublets within Japanese and Korean. At first, we will present Japanese doublets derived from the shift between /d(t)/ and /n/.

- 1) OJ ta(who)~OJ nani(what) cf. J nan-de/na-do/na-zo(why)
 2) OJ ta(rice field)~J no(field)

- 3) OJ take(bamboo)~J si-no(a bamboo)/no-dake(id.)
- 4) OJ taka-si(high)~OJ naga-si(long)
- 5) J taka-si(high)~J noppo(tall)
- 6) OJ tati(sword)~J nata(hatchet)
- 7) OJ tabe(to eat)~OJ name(to lick)/nomi(to drink)
- 8) J dami(dialect accent)~J namari(id.)
- 9) OJ ta-e(to die out)~J na-e(to wither)
- 10) OJ tugu(to tell)~OJ noru(id.)
- 11) J toroi(dull)~J noroi(slow)
- 12) J tonma(fool)~J noroma(id.)

The following are Korean doublets(Lee Dong-sik, graduate student, has supplied me with the last 3 data).

- 1) MK nyen(other)~K talun(id.)
- 2) MK nwuyek(straw raincoat)~K tolongi(id.)
- 3) MK stu-(slow)~K nuli-(id.)
- 4) MK -nAy(plural suffix)~K tul(id.)
- 5) MK nwuy(time)~K ttay(id.)
- 6) MK nwut-(to burn)~MK thA-(id.)
- 7) KD nengkhwul(vine)~K tengkwul(id.)
- 8) K nal-(to fly)~K ttu-(to rise)
- 9) K nuli-(slow)~K teti-(id.)

4 The Middle Korean initial /n/. if directly followed by /i/ has been lost in the Modern Korean language: e.g., MK nyelum(summer)>K yelum(id.), MK nyep(side)>K yeph(id.), MK nimkwum(king)>K inkum(id.), etc. But if followed by more opened vowels, it has not been lost as we see in MK nwun(eye), MK namo(tree) and MK naksi(fishing). This loss of initial /n/ is said to have started since the latter half of 18th century (I Ki-mwun, 1975. p.224).

By comparing Mongolian ner (name), however, with MK ilhwm (id.), we notice Korean ending -wum is missing in the Mongolian, which will be a Korean noun suffix. Its Korean etymon must be derived from MK nilA-/nil-/nilu-(to tell), whcih has become K ilu-(id.) by dropping its initial/n/. Thus with more such examples, we could assert that the initial/n/ dropping of the Korean language may have happened much earlier in some cases.

It is highly probable OJ na(name) is derived from OJ noru (to tell), which is cognate to MK nilA-(id.). We assume J namafe (name), ends with a Japanese noun suffix -fe, which is found in such words as J inishi-fe (ancient days), J fada-fe(skin), J fuku-be(globefish), and J kabe(dream).

Modern Japanese fugu (globefish) has lost the noun suffix -fe in the case of fuku-be, J kabe corresponds with MK skwum (dream). cf. Modern Korean kkwum(id.)

J yume(dream) and MK skwum(id.) must have been derived from their reconstructed original form *tum-(to dream), which can be supported with MK ca-(id.), MK nwup-(to lie down), and J ne(to sleep). It is a well-known fact that there is a shift between the initial Korean /t/ and /k/, as we see in the example timchAy and kimchAy(korean pickles).

Now, if we examine such pairs of Japanese words as OJ ne(elder sibling)~OJ e(id.), OJ na(you)~OJ i(id.), J narisama (appearance)~J ari-sama (id.), and J noti (later)~J ato (id.), we can claim the latters are

derived by losing their initial /n/ and that it happened very early in the Japanese language history.

We can consolidate this contentment of ours by showing more such examples.

- 1) OJ na (1st person pronoun) ~ OJ a (id.)
- 2) OJ nani (what) ~ OJ ani (id.)
- 3) OJ nazo (why) ~ OJ aze (id.)
- 4) OJ nami (wave) ~ OJ umi (sea) / ama (id.)
- 5) OJ niru (to boil) ~ OJ iru (to roast)
- 6) OJ nusi (master) ~ OJ usi (id.)
- 7) OJ nubatama (black seed of a plant) ~ J ubatama (id.)
- 8) J nigai (bitter) ~ JD igoi (id.)
- 9) OJ nari (to become) ~ OJ ari (to be)
- 10) OJ nishi (west) ~ JD iri (id.)
- 11) J nasi (pear) ~ J ari-no-mi

The doublets 10) and 11) with intervocalic /r/ and /s/ difference are proven to be cognate with the following examples.

- 1) JD agari (east) ~ J higasi (id.)
- 2) J akari (light) ~ J akasi (id.)
- 3) J omori (weight) ~ J omosi (id.)
- 4) J ...kiri (only) ~ J ...kisi (id.)
- 5) J takuru (to roll up) ~ J takusi (id.)
- 6) J ...bakari (alone) ~ J bakasi (id.)
- 7) J yahari (after all) ~ J yahasi (id.)
- 8) J funanori (sailor) ~ JD funanos (id.)
- 9) J watarimori (ferry captain) ~ J watasimori (id.)

The etymons of J higasi (east) is hi (sun)-agari (to rise), which is contracted into *higari, then becomes higasi (east) with /r/ > /s/ shift. Its variant himgasi (id.) is derived by nazalization of intervocalic /g/ as we see in the following: J togaru (sharp) > tongaru (id.), J aguri (agape) > anguri (id.), J Bigo (a province) > Bingo (id.), etc.

5 Conclusion

Kim Sa-yep's postulation that there are mutual /t/-/n/ correspondences at the initial position have been above proved, which explain why the Japanese initial /t/ changes into /n/ when the Japanese word is borrowed into the Korean one, as we see in the cases of Korean nokata (navvy) and nokan (earthen pipe), borrowed from Japanese dokata, and dokan respectively.

The /t/-/n/ shift observed between Japanese and Korean of the initial position exists within Japanese and Korean themselves. And it is noticed that Korean initial /n/ loss may also have happened in the prehistoric period as we see in the case of MK ilhwum (name). And the Korean initial /n/ loss is not unique to the language, but it also observed in the Old Japanese language.

From the fact that the mutual /t~/n/ shift exists between Japanese and Korean, we could assert that the relationships among them have been deep rooted and close, though we admit they split in prehistoric days.

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SOME PROTO AFFIXES

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In his *Sanskrit Language* Burrow treats the nominal stem formative affixes as being composed of a number of single phoneme elements to which no meanings can be assigned. These are not 'derived from what were originally independent words, but are in every case analysable into their component parts ... These primary elements include nearly all the available phonemes, but the ones commonly used are *r, n, s, t, y/i, v/u, m, H and k*... Between the original simple suffixes, as so analysed, no discernible distinction of meaning or function can be found' (1955:117-18). A number of the above affixes, along with others, occur in the formation of verb stems (289).

We are now in a position to modify his observations to some extent. Each of these 'primary elements' is found as an identifiable morpheme in Afroasiatic (AAs). Most have both longer and shorter forms. The longer, usually independent words, help to identify the semantic content of the shorter, affixal, ones. We here compare these AAs bases (citing some of their derivatives) with the corresponding forms in Indo-European (IE). The formal/semantic similarities between the two are sufficient to conclude that we are dealing with cognate affixes.

The idea that affixes derive – or may derive – from earlier free forms has a long and checkered history (cf. Robins 1968:157, 173-74). There are numerous attested cases (Hodge 1970), but considerable scepticism has been expressed (e.g. Lehmann 1967:39). On the other hand, Möller (1906) not only derived some of the affixes here discussed from independent pronouns but also connected them with IE. With far more data, along with the consonant ablaut framework, we are able to correct, clarify and add a great deal to the discussion.

The AAs bases concerned fall into several categories. Some are words for body parts which develop into directional morphemes such as prepositions

or into affixes of person, place, et al. Such are ****l-C** 'hole of mouth or eye, to, towards', ****b-w** 'foot, person, place, at, from'. Others are deictic elements which develop into demonstratives, personal endings and affixes reflecting the involvement of an actor or the performance of an action. Such are ****?-** 'indefinite actor, I, causative', ****s-C** 'the aforesaid actor, he, she, causative', ****t-C** 'a differentiated unit, one of (a group), a collective, you, she', ****h-C** 'the aforesaid, he, she, causative', ****k-C** 'other, I, you, third person'. An interesting aspect of the use of these chronomorphs as affixes is that the same ones have been affixed at successive times in the prehistory and history of the languages involved. For example, Eg. *s-n-b* and Ar. *salima*, both meaning 'be in a state of well-being', go back to the proto language in their formation, one from ****(s-)NI-b** and the other from ****(s-)I-Nb**. Historically, Egyptian makes a (further) causative by adding *s-*, *s-s-n-b* 'preserve, heal', while Arabic uses *?-* to make the causative of *salima*, *?aslama* 'keep someone safe'.

Burrow's list begins with *r* and *n*. He elsewhere brings in *l* as alternating with *r* (82, 120, 128). The distribution of *l* (eastern Indic, Iranian) shows that it is dialectically marginal and the more original. Consonant ablaut gives us basic *l, r* from ****IH** and *n* from ****NI**, so that we expect all three of these to alternate in our attested forms.

The set of *l/r/n* affixes common to AAs and IE come from proto Lislakh (LL) ****l-C**, short form ****l**, 'hole, cavity', developing into words for 'eye' (e.g., East Cushitic [EC] ***?il-** Sasse 1979:5) and 'mouth' (e.g. Eg. *r-?*, written with MOUTH, Sign List D21, Gardiner 1957:452). From 'mouth' we get directional and relational developments, as seen in Sem. ***1-** 'to, for', Eg. *r*, Co *?e-/?ero-* 'toward', Eg. *n* 'to, for, of', Ha. *n(a)* 'pertaining to, the one of', etc.

The IE *r/n* stems afford classic examples of the *l/r/n* ablaut series and of suffixes from ****l-C**, meaning 'pertaining to' aut sim. Examples from Sanskrit (here and elsewhere mainly from Burrow) are: From *vadh-* 'slay', *vádhar* 'weapon' ('that which pertains to slaying'). There is a variant *badh-* which keeps LL ****b**, normally shifted to IE ***w**, Skt. v. *dhā-* 'suck', *ūdhar* (G. *ūdhnas*) 'udder'. *mahā-* 'big', *máhar* (Vedic I. *mahnā*) 'greatness'. *bhū-* 'be', *bhúvar* (Vedic I. *bhūnā*) 'abundance'. The directional sense is reflected in: *uṣa-* 'dawn', *uṣarbúdh-* 'waking at dawn'. *vana-* 'woods',

vanargú- 'going into the woods'.

From 'toward' there developed a deictic sense 'that one, the aforementioned', as in Ar. (*?a*)*l-* 'the' and Ha. *-ṭ* 'the (*f.*)', *-ṇ* 'the (*m., pl.*)'. In IE this appears as *al-* in **al-yo-* 'other' ('pertaining to that one'), Lat. *alius*, and as *il-* in Lat. *ille* 'that one', the difference in vocalization probably being secondary developments from prothetic *?ə-*. From ***(?ə-)NI-* we get Skt. *anya-* 'other', Av. *anyō*. With suffixes *-t-er-* we have Lat. *alter*, Lith. *antras* 'other (of two)'. (Examples from Meillet 1964:262.)

Another AAs development is from the deictic to a passive: Ar *?inkasara* 'it got broken', i.e. 'a breaking occurred with reference to it', without identification of the agent. In IE the ***IH* form occurs in the same medio-passive or impersonal sense: Lat. *vehor* 'there is a carrying with regard to me', where *-r* is 'with regard to' and *-o-* designates first person. Compare Umbrian *ferar* 'one will carry', *ier* 'one goes', Lat. *vehitur* 'one goes' (Meillet 1964:235).

The affix *s* is from the short form of ***s-C* (***s-w?*), a deictic element forming demonstrative and personal pronouns. For example: Eg. *s-y* 'he, him, it', *s-y* 'she, her, it'. Sem. **šuw-* 'he', **šiy-* 'she' (Diakonoff 1988:72). Ber. **as* 'he, she, it' (Prasse 1972:164). Ch. **si* 'he' (Kraft 1974:78). Highland East Cushitic (HEC) **isi* 'he' (Hudson 1989:77). IE **sō* (*m.*), **sā* (*f.*) 'the aforesaid, this, that' (Watkins 1985:62).

As an affix *s* adds an agent. This may form a causative (the addition of an intermediate agent) or a stative/factitive (the result of the agent action). For example: Eg. *c-n-x* 'live', *s-c-n-x* 'nourish'. Sem. **š* in Ug. *l-ḥ-m* 'eat', *š-l-ḥ-m* 'feed'. Ber. *imgār* 'be big' *səmgər* 'make big' (Prasse 1973:58). Ch. Ha. *sàyaa* 'buy' *sayas dà* 'sell'. For Omotic and Cushitic Bender reconstructs **s* and **š* (1990:670).

In IE *s* occurs both as a prefix ('moveable *s*') and as a suffix. In his comparative study of Semitic, Egyptian and IE Möller held that the prefix *s* was the same in all three and had similar semantic content (1906:244-45). As an example he cited IE **m-ld-* 'to melt (*intr.*)' and **sm-ld-* 'to melt (*tr.*)' (usually **meldh-*, **smeldh-*). He explained that the non-*s* forms and the *s* forms had in general merged semantically. In the case of *melt*, while this form now has both transitive and intransitive uses, *smelt* is still definitely

causative. An examination of the reconstructions in Watkins (1985) shows that a larger number of *s* forms, both prefix and suffix, retain the causative/factitive sense than we would expect from reading the literature. In many cases the connection between the plain and affixed forms has been obscured by assimilation (devoicing of the consonant after *s*) and by differences in consonant ablaut. Examples are:

bhel-* 'to cry out', **spel-* 'to say aloud, recite' (from *s*-*bel*, with original ***b*). **del-* 'long', **stelə-* 'to extend', with analogous non-*s* **telə-*. **deru-* 'to be firm', **ster-* 'stiff' ('made firm'). **dheb-* 'dense, firm', **stebh-* 'to support, fasten' ('make firm'). **ger-* 'curving', **sker-* 'to turn, bend'. **lek-* 'to leap, fly', **selk-* 'to pull, draw'; here the *s* form reflects an earlier meaning of **lek-* as simply 'go'. **trep-* 'to turn', **streb(h)-* 'to wind, turn', the latter with *bh* from ***bH* (*p* plus *H*). **wer-* 'to raise, lift', **swer-* 'to lift, hang on a scale', i.e. put in a raised position.

Suffix examples: **bhel-* 'to blow, swell', **bhres-* 'to burst', **mera-* 'to hinder', **mers-* 'to trouble'. **tāg-* 'to set in order', **teks-* 'to weave', with assimilation of *g* to *s*. **ter-* of Skt. *tarala* 'moving to and fro', **tres-* 'to tremble' ('having been but in a state of trembling'). (**tres-* is recognized as related to **trem-* 'tremble'. One has *-s*, the other *-m* from ***Nb-*; see below.) **wer-* 'to turn', **wers-* 'to confuse, mix up'. This suffix is also that of the *s* aorist, indicating as it does the accomplishment of the action.

The affix *t* is from ***t-* (***t-* *C* ?). This is the most frequent affix in AAs, being the base of personal and demonstrative pronouns, and of both nominal and verbal affixes. Some long forms are: Eg. *t-n* 'this', suffix *-t-w* 'indefinite subject', also passive formative. Ber. **tat* 'she' (Prasse 1972:173). Ch. Ha. ?*ita* 'she'. Cu. Sc ?*aata* 'you' (Ehret 1980:282). IE **tod* 'that'.

***t* has an enormous range of semantic developments, but it seems most reasonable to assign it an early proto meaning such as 'differentiated unit'. Its familiar label, 'feminine *t*', reflects a late but prehistoric specialization. Some Arabic examples may be given to illustrate the 'unit' meaning. All end in *-at-u-n*, the *-u-* being nominative, the *-n* indefinite. *ḥamāmun* 'pigeons', *ḥamāmatun* 'a pigeon (male or female)'. ?*asadun* 'lion', *ma?asadun* 'a place (*ma-*) abounding in lions'. *jalasa* 'sit', *jalsatun* 'a seat,

sitting', *jilsatun* 'manner or way of sitting'. *kasara* 'break', *kisratun* 'a fragment'.

In IE *t* also has a wide range of uses, but recognition of its prehistoric semantic content makes possible reasonable interpretations of many of these. Note the unit quality of *-t-* in: Skt. *gántum* 'to go' (a unit of going), *pr̥ṣat-* 'a drop', *yoṣit-* 'woman', *niyut-* 'team'. Hitt. *kartimmiatt-* 'anger'. Lat. *lac*, G. *lactis* 'milk' (unit quantity). (An abstract is treated as a unit.)

In one development the addition of *t* as a unit agent became a passive or reflexive formation. Eg. *s-ḡ-m-t-w* 'someone hears', *s-ḡ-m-t-w-f* 'he (-f) is heard'. Ar. *kassara* 'break to pieces', *takassara* 'be broken in pieces'. Such usage also occurs in IE: Skt. *yajātá-* 'to be adored', *darśatá-* 'visible', *śrutá-* 'heard'. SC *znāt* /*znáat*/ 'known'. Both adjectives and participles may be so formed.

Another pronominal is **y* 'the referred to', related to Burrow's *y/i*. It is likely that this base too had a second (now unknown) consonant. Independent as well as affix forms occur widely. Its relative meaning is reflected in: Sem. Geez *?ay* 'which?; whatever', Ar. *?ayyun* 'which' Ug. *?ay* 'any' (Leslau 1987:49). Ch. Ngizim *-yee* 'who, whom, whose?' (Schuh 1981:177). Om. Ari *ayi* 'who', Gimira *ay* 'what?' (Fleming 1976:321). Cu. HEC **ayye* 'who?'. IE **yos* 'who (relative)', Skt. *yas*. (On the possibly related Berber **i/y* see Prasse 1972:190-91.)

This relative element developed into a third person referent, forming pronouns and affixes. For example, we find in Chadic Tangale *yi*: 'he' (Kraft 1974:78). It is widespread as a third person (often masculine in the singular) verb prefix (exx. Diakonoff 1988:85-87): Ar. *yaktubu* 'he's writing', Ha. *yaa tãfi* 'he went', etc. It also occurs as a third person suffix: Phon. *?-l-y* 'his god', Heb. *pānāy* 'his face' (Dahood 1970:3.375; this seems more likely than for the *y* to be simply a glide, Huehnergard 1991).

In another usage a suffix *-y-* or *-yy-* indicates 'that a person or thing belongs to or is connected' with the preceding form, yielding 'the relative adjective' (Wright 1933:1.144). Egyptian has *-y(-)*, but we cannot tell whether it is doubled: *r-s-w* 'south wind', *r-s-y* 'southern' (Gardiner 1957:61), Ar. *?arḍun* 'earth', *?arḍiyyun* 'earthly'. This formation was also recognized by Möller as common to Semitic, Egyptian and IE, and as from the same base as the pronominal *y* (1906:28-29).

IE has **i/*ei*, **-yo-* and **yy-* corresponding to the above AAs forms (cf. **i-* in Watkins 1985:26, Pokorny 1959:281 and the discussion in Szemerényi 1970:190, 194-95). Skt. *yas* 'who (relative)' reflects the early semantics, while others, such as Latin *is* 'he', *eius* 'his' show the development to a personal pronoun.

The ***y* base is also used in IE to add an agent. The most transparent examples are those having a causative meaning: Skt. *pālāmi* 'I fly', *patáyāmi* 'I cause to fly'. In *pātáyante* we have both the *-ay-* suffix and the middle ending *-e*. The meaning is 'they fly', the agent which propels them being they themselves. The *-y-* therefore adds an agent, but it does not necessarily follow that the agent is different from the subject. This accounts for the fact that so many verbs with *-ay-* are not 'causative': *citáya-* 'notice, observe' ('do perceiving', *cit-* 'perceive'), *turáya-* 'hurry, speed' ('do passing', *tur-* 'pass'), etc. The non-causative examples, which are numerous, have been problematic (cf. Burrow 330), but this is due to a misunderstanding of the earlier nature of the suffix (cf. Macdonell 1910:393, who looks for a common, non-causative, origin). This agent suffix *y* also occurs in adjectives: *gúhya-* 'to be hidden', *hávya-* 'to be invoked' (Burrow 184).

Corresponding to the AAs relative adjective we find both *-y-* and *-yy-* in IE. E.g., **-yo-* in Skt. *sat* 'truth', *satyá-* 'true', *ratha-* 'wheel', *ráthiya-* 'relating to a chariot'. The Sanskrit suffix *-eya-* comes close to Semitic *-iyy-* in that *-e-* is from **ai*. We therefore have *-ayya-* [əy:ə]. IE **eyyo-*, **oyyo-* and **ayyo-* have all been proposed for proto IE (see Lindeman 1964:45). Skt. *-eya-* forms adjectives from place and other names, as well as common nouns, e.g., *Jānaśruteyá-* 'son of *Janaśruti*', *ārṣeyá-* 'descendant of a sage (*ṛṣi-*)' (Burrow 198). (On *-eya-* see Lindeman 1964:41-127.)

Skt. *v/u* is ambiguous etymologically as IE **w* may be from LL ***w* or from LL ***b*. In this section we examine only forms we consider to have come from ***b*, specifically the *b* of ***b-w* (short form ***b*) 'foot', with further development into words for 1) person and 2) place, thing, abstract, and directional morphemes. The proto meaning is proposed on the basis of the hieroglyph FOOT (Sign List D58), which is used to write this chronomorph in Egyptian. Examples of independent and affix forms are: Eg. *b-w* 'place', *b-w n-b* 'everyone, everything', *b-w n-f-r* 'goodness' (*n-f-r* 'good'),

Previous publications have dealt with the various developments of ***b-w* (see especially Hodge 1991a:156-57). This treatment may be expanded to cover such derivational suffixes as Skt. *-va-* and *-ma-*: *ṛṣ-* 'to thrust [up]', *ṛṣvā-* 'lofty'. *vr-* 'to cover, surround', *ūrvā-* 'enclosure', *hras-* 'to become short', *hrasvā-* 'short, small, low (entrance)', *ghṛ-* 'to burn', *gharmā-* 'heat', *kṛ-* 'do' *karma-* 'deed'. There are also numerous combinations of suffixes which include reflexes of ***b-w*, e.g. *pr-* 'to separate', *pārva-* 'joint' (pertaining to [-*n*] the place [-*va-*] of separating).

Semitic has ʔ , h , $h.\text{c}$, x and $\dot{g}$, all of which are to be reconstructed for proto LL (contra Petráček 1988). The first four are the bases of agent affixes: $**\text{ʔ-}$ 'indefinite agent', its ablaut $**\text{ʔH-}$ which becomes historic h , also an agentive affix. $**h-$, a deictic element, is the basis of directional morphemes, causative/factitive affixes and pronouns. Its ablaut $**hH-$ yields c , which also serves as an agent affix, e.g. Eg. $q\text{-3-c}$ 'to vomit' and its parallel form $q\text{-3-s}$ with agentive s .

There is a clear example of *h* as a causative/factitive affix in IE. This

is Hittite *-ah*, as in *sagai-* 'omen, *sakiyah-* 'give an omen' (Puhvel 1984:412-13). As *-ah-* may be written *-ahh-*, it is voiceless. As it functions like *h* in AAs, we identify it as *h* rather than *x* (see Hodge 1991b).

Burrow's *k* as an affixal element is most often derivable from ***k-C* 'other'. Egyptian has *k-y* 'other, another'. Co. *ke* suggests that the earlier form was ***k-/* (Eg. *k-3*), which is attested in Chadic, Mafa-Mada **ka* (Rossing 1978, No. 240). For the most part only the short form *k* is reflected in the data, sometimes with an *-m* (***Nb*) suffix (e.g., Ha. *kāmaa* 'similarity'). Sem. **k-* 'like' (Ar. *ka*, etc., Leslau 1987:285). Ber. **āk* (enclitic to pronouns, Prasse 1972:191-92). Ch. **k-* 'like' (Ngizim *kāā*). There is a further development shown in Ng. *ká* 'the one of, pertaining to' (Schuh 1981:89, 86). Cu. HEC **ka* 'this', **ko* 'that' (m., Hudson 1989:153, 150).

***k-* also developed into personal pronouns. As 'other' it could refer to any person, so the distinction of person was made with other affixes (Hodge 1969). Examples: Eg. *-k* 'you (m.)', *-k-w/-k-?* 'I', Sem. **-ka* 'you (m.)', **ki* 'you (f.)', Ber. **ək* 'you' (Prasse 1972:164). Ch. **ka* 'you (m.)', **ki* 'you (f.)' (Kraft 1974:74). Om. SOm **ket* 'they', Galila *-ek* 'they' (Fleming 1976:315, 314). Cu. **ku* 'you (m.)', **ki* 'you (f.)' (Bender 1990:665).

A good example of *k* as 'other' in IE appears to be the Sanskrit ending *-śas* (from ***kY-s*, with palatalization), Greek *-kas*. Examples are Skt. *ekaśas* 'one by one' (i.e., one [after] another), *dviśas* 'in pairs', Gk. *andrakás* 'man by man' ([one] man [after] another). Gk. *hekás* 'far off' has been variously explained. One derivation takes it from **wekas* < **swekas*, taking it as 'by oneself', so 'far off' (Buck 1933:351). If we take the **we-* from ***b-*, we have 'other place'. The *h-* could be the substitution of deictic ***h-*, so 'that other'.

It is likely that OP *kā* (generalizing particle after 2nd pers. pronoun) (Kent 1953:178) is a specialized use of ***k-*, parallel to the above cited Ber. **āk*, somewhat in the sense of 'you, too!'. Initial *k-* is found in Lith. *kītur* 'otherwise'. Examination of the words assigned to IE **kwi-* (i.e. ***kbi-*) shows that many could better be taken from ***k-* 'other'. The forms with **w* (from ***b*) would then parallel the AAs forms with *-m*. Plain ***k-* gives us the forms without *b/w*, ***k-(b)* would yield **kwi-* and ***k-(Nb)* would give **k-m*. 'Other, another' seems to be a good origin for a relative.

The IE suffix *-k-* forms a number of nominal semantic types: feminine, one concerned with, diminutive, abstract, etc. Many could be reasonably but not certainly attributed to ***k-* 'other'.

The above examples show that a great many IE affixes having Burrow's elements as components have clear AAs cognates and can be attributed to the appropriate LL bases. Further research along these lines is sure to clarify the origin of most IE and AAs affixes.

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A DIACHRONIC STUDY OF THE WORD ORDER OF
ATTRIBUTIVE ADJECTIVES IN POLISH*

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I. INTRODUCTION

A. The Problem, Historical Background, and Purpose of the Study

The word order of adjectives in Polish presents a problem that does not exist in the other Slavic languages. The adjectival word order in Polish is variable, i.e., the adjective may precede or follow the noun, whereas in the other Slavic languages, the adjective customarily precedes the noun. This was not always so for these languages because early records show adjectives in the post-position as well as the pre-position. Such is the case in Serbian and Croatian literary works written before the seventeenth century. Old Church Slavonic, the earliest written language of the Slavic peoples, shows this characteristic, also. Czech translations of the Bible contemporary with those used as a source for the Polish Bible of Queen Sofia (fifteenth century) also contain a large number of adjective-noun phrases with adjectives in the post-position (Biblia Królowej Zofii 1968). A variable adjectival word order has appeared in Polish literary works from the earliest times until the present.

After Poland became Christian in 966, she adopted Latin as her official and literary language since Polish was only a spoken language. Thereafter, all official records and documents were written in Latin for approximately 300 years. The literature, which was ecclesiastical, consisted of annals, chronicles, and the lives of saints written in Latin.

The purpose of this study is to investigate the word order of attributive adjectives and nouns in Polish during the formative period of the written language through the time of the full development of the literary language. The periods to be examined include the years of late medieval humanism and the Polish Renaissance extending from 1250 to 1600. These first 350 years of the literary language have been chosen because it is believed that it is necessary to study adjective-noun word order during the development of the literary language to reach an understanding of the variable adjective word order in Polish. The investigation includes the study of influences at work in the language which might cause the post-position as well as the pre-position of an adjective in relation to the modified noun. Possible influences are ancient rhetoric and Latin. Prosody and the natural rhythm of the Polish language could also be a secondary influence, but these factors were not considered in this study. Initially, the hypothesis to be tested included the theory that the post-position was inherent in the earliest form

of Polish. However, since the earliest Polish existed during the period of preliteracy, there are no written records available for analysis. Therefore, that theory was abandoned. The part of the hypothesis that has been retained for testing is the theory that ancient rhetoric and Latin sentence structure per se influenced the adjective-noun word order in early literary Polish. Latin has a variable adjective-noun word order. In this investigation, emphasis has been placed on the literature of the sixteenth century because of the importance of the period and the number and variety of literary works, some of which also exist in Latin.

B. The Investigation and Method of Analysis

The texts to be investigated were chosen for their representativeness of the period and availability, and the study was restricted to prose works because of the great variability in word order that may occur in verse. As wide a range of literary genres as possible was examined in order to obtain a representative sampling of adjective-noun word order for the periods under investigation.

From the materials available for the fourteenth and fifteenth centuries, two collections of sermons and a gloss were analyzed. For the sixteenth century, texts chosen included Bibles, treatises on government, short essays and letters, an adventure tale, religious works, and paraenetic works. Authors of these texts were among the most outstanding of their times. Where available, corresponding Latin texts were also analyzed.

After the selection of texts was made, the individual texts were analyzed for adjective-noun phrases containing the categories of attributive adjectives designated for investigation. The comparatively short texts were analyzed in toto, and of the longer texts 50 pages or the equivalent number of words were analyzed. A limited analysis was made of the remaining texts. Corresponding Latin texts were analyzed in the same way as the Polish texts and compared with them. The percentages of attributive adjectives in the pre-position and post-position were calculated for the analyzed part of each text to obtain an approximation of the distribution of adjectives related to the genre and literary period.

C. Definitions

Before proceeding further, it is necessary to define and discuss the key terms used in this study. Basically, these fall into three groups: the group relating to the Polish texts; that relating to the Latin texts; and that relating to ancient rhetoric.

The term "attributive adjective," as generally used, has too broad a meaning for the purposes of this study. The term is used here in a more restrictive sense than the general definition. The discussion regarding the attributive adjective in what follows is based on material in the grammars by George O.

Curme (1925, pp. 121-123) and Randolph H. Hudson (1966, pp. 58-61).

The attributive adjective is a modifier that may precede or follow the noun that it modifies. The attributive adjective may be a descriptive adjective (tall man, pretty woman) or a limiting adjective (these pictures, one time, his car, which school). The types of attributive adjectives that are considered in this study are: (1) descriptive adjectives, (2) adjectives derived from nouns that might be considered possessive adjectives in the strict sense, according to historical considerations, but which function in context more as descriptive adjectives than limiting adjectives (Boży, Chrystusowy, Dawidów), and (3) participles that function as attributive adjectives. When the term "attributive adjective" is used, it refers to these adjectives.

Limiting adjectives, as a group, are excluded from this study. They include: (1) possessive pronoun-adjectives, (2) demonstrative adjectives, (3) cardinal and ordinal numbers and derivatives of these, (4) relative adjectives, (5) indefinite adjectives, and (6) interrogative adjectives. The Polish equivalents of these include: mój, twój, sam, ten, jeden, pierwszy, który, cokolwiek, wszystek, każdy, wiele, drugi, inny, kilka, własny (in the sense of a possessive), taki, jaki, and wszelki.

Even these definitions can be ambiguous when applied in certain texts; therefore, great care has been used in the classification of adjectives. Still there may be a difference of opinion about some classifications.

Definitions regarding Latin adjectives are based on discussions in Myrtle Wilkins' dissertation (1940). Wilkins defines a determinative adjective as one that "expresses a quality by which we recognize, distinguish or classify. The quality belongs objectively to the object and there is no question of personal subjective appraisal" (pp. 2-3). She defines a qualificative adjective as one that "represents a subjective appreciation or judgment, or a personal emotional reaction to the object" (p. 3).

Three terms relating to ancient rhetoric are used in explaining certain of the adjective-noun word orders in the investigated texts. These terms are "emphasis," "chiasm," and "anaphora." "Emphasis," as used in this study, refers to the reversal of the adjective-noun word order from the normal to emphasize the adjective. "Chiasm"/"chiasmus" as defined in Webster's Third New International Dictionary is "the inversion of the order of syntactical elements in the second of two juxtaposed and syntactically parallel phrases or clauses" (1976, p. 386). The term "anaphora" is defined well by Wierzbicka as the repetition of a certain word order (1963, p. 113). Here the term applies to the repetition of an adjective-noun word order to achieve emphasis or contrast.

II. FINDINGS

A. General Remarks

In the past, the study of the word order of adjectives in Polish has been meager. For the most part, such study has consisted of investigations that have been either parts of larger general studies of syntax and word order or short papers based on the analysis of limited source materials. The present study has undertaken to broaden the knowledge and understanding regarding the word order of adjectives in Polish by investigating the aspects of this subject that have been omitted or merely touched upon in the past as well as the aspects studied in previous investigations. This word order has been analyzed beginning with the earliest preserved manuscript of Polish prose, Kazania świętokrzyskie, and progressing through a series of texts written during a period in which the literary language reached maturity. Where available, corresponding Latin texts have also been studied to determine the influence of Latin on the word order of Polish adjectives. Previous studies have not included Latin texts. Through the thorough analysis of the Polish and Latin texts, conclusive evidence (lacking in previous studies) showing the influence of Latin on the word order of Polish adjectives has been found.

B. Discussion of Findings

The discussion that follows uses the adjective classifications that proved to be most suitable in this investigation.

(1) Adjectives with the Suffix -ski, Possessive Adjective Forms, and Participial Adjectives

The word order of these three categories of adjectives in Kazania świętokrzyskie was found to be predominantly the post-position (see appendix). This pattern continued in the other texts under study with some deviations. Adjectives with the suffix -ski and the possessive adjective forms such as człowieczy and Boży, which are also found in other Slavic languages, are inherited from early Slavic. The deviations are found among certain adjectives ending in -ski as used by certain authors during the sixteenth century, particularly Rej and Kochanowski (see appendix). Both authors referred to polski język instead of język polski. This word order, the pre-position, also occurred with Iaciński. The context, in some cases, clearly indicates the simple use of the adjective without emphasis or contrast. This suggests that certain writers may have considered the pre-position normal for adjectives which refer to certain nations or languages.

(2) The Adjective święty

From the beginning, the adjective święty has shown a variable word order. Even in Kazania świętokrzyskie, examples of the post-position are found. However, in this text the pre-

position prevails, and this pattern is found for all the texts with some variations appearing, particularly in the works of sixteenth century writers of the Reformation. The variability of the position of this adjective is associated in part with Biblical and ecclesiastical expressions whose word order has become fixed by usage. Such expressions appear in the earliest texts and continue to appear throughout the periods under study. These expressions will be discussed in the section on Latin influences.

Besides the variations in the word order of święty that can be explained by ecclesiastical influences and the techniques of ancient rhetoric, there are the variations that appear in Rej's Żywot, Krowicki's Napominanie, and Skarga's Kazania sejmowe. The adjective święty appears repeatedly after the saints' names, especially in Napominanie. It was not possible to determine the exact reason for this word order. This could have been a style that developed among some writers of the sixteenth century. Perhaps, święty was being used as a substantive in apposition with the saint's name, e.g., Paweł święty = Paul the saint. Another possibility is that, for a brief time, the normal position for święty in this context was considered the post-position.

(3) Adjectives of Time

The adjectives of time appear in the earliest monuments and most of the other texts that were analyzed. These are the adjectives niniejszy, wczorajszy, dzisiejszy, przeszły, przyszły, and teraźniejszy. The normal word order for these adjectives is the pre-position, but there is some variability in word order which can usually be explained by emphasis.

(4) Common Descriptive Adjectives and Other Adjectives and Normal Word Order

It was found that common descriptive adjectives such as dobry, mały, zły, złoty, and wielki have a position that is described as "normal," i.e., they are in the pre-position. Other adjectives, such as rozmaity and wierny, which do not fit into the preceding categories are also normally in the pre-position, but sometimes their word order is variable in a way that is difficult to explain as the technique of emphasis. This variability suggests an ambiguity in the minds of some writers on the normal position of these adjectives.

(5) Emphasis, Chiasm, and Anaphora

The three devices of ancient rhetoric, which are emphasis, chiasm, and anaphora, are evident in most of the analyzed texts including the earliest monuments. Of the three devices, emphasis was used the most often. This technique many times explains the reversal in word order in all the categories of adjectives that have been discussed. Anaphora was used frequently and helped to explain the same word order for a series of adjective-noun phrases. Chiasm was used the least of the three devices. Neither anaphora nor chiasm was found in the sections of the Bibles that were analyzed. The style of the Bible is generally simple and direct.

The techniques of ancient rhetoric explain much of the deviation found in the position of the attributive adjective, but it was found in this study that although these were important factors, there were other factors at work. These factors are discussed in the next section.

(6) The Latin Influence

The Latin influence can readily be seen in Kazania świętokrzyskie and Kazania gnieźnieńskie because Latin passages are present in both texts. In addition, the Latin sermons from which Kazania gnieźnieńskie originated are available for comparison. Several phrases that had become or were becoming fixed by usage, at the time, are seen in these texts: Boże Narodzenie/Narodzenie Boże -- Nativitas Domini; Syn Boży -- Filius Dei; Bog wszemogący > Bóg Wszchemogący > Bóg Wszchemocny -- Deus omnipotens; Duch Święty -- Spiritus Sanctus. It should be noted that in the first two phrases, the genitive of the noun is used in Latin where the possessive adjective form is used in Polish.

In Raj duszny, it is seen that the adjective word order in Polish does not always correspond to that in the equivalent Latin phrase, as for example: duchów angelских -- angelici spiritus; króliu niebieski -- caelestis rex. Here the Latin word order indicates emphasis, whereas the Polish does not.

In Napominanie, striking examples are found in which the positions of the corresponding adjectives vary in the Polish and Latin texts. For example in one passage the Polish adjective-noun phrase is wieczny żywot and the corresponding Latin phrase is vita aeterna. Both adjectives are in their normal, unemphatic positions. The underlying reason for the difference in position is that the Latin adjective aeterna is a determinative adjective and as such normally occupies the post-position. The reason for the word order of the Latin adjective is transferred to Polish but not necessarily the original word order. A number of examples similar to this can be found in Napominanie. If chiasm or anaphora was present in the original Latin, it might be transferred to the Polish phrase, but the word order could be different from the original. What may appear as an imitation of the Latin word order, where the Polish word order agrees, may in fact be a coinciding of the word orders of the two languages in the particular situation. There are also numbers of examples of Polish adjective-noun phrases, for example in the Brzeska and Wujek Bibles, that follow the word order of the corresponding Latin phrases in what appears to be blind imitation. Both processes were at work in the sixteenth century.

Finally, the Latin genitive of the noun frequently appears as an adjective in Polish, e.g., Dei -- Boży, caelorum -- niebieski. The post-position of these Polish possessive adjective forms and adjectives with the suffix -ski may have originated from the post-position of the Latin possessive and the genitive of the noun during the formative period of the Polish written language. As has already been stated, this word order appears in the earliest texts. If this word order was not patterned after Latin, then the other logical deduction is that

the post-position of these adjectives was inherent in early Polish.

(7) The Distribution of the Positions of Attributive Adjectives

It appears that the percentage of attributive adjectives in the post-position in the analyzed texts is related, in large part, to the style of writing and the influence of ecclesiastical Latin literature.

The incidence of the post-position of attributive adjectives in Polish during late medieval humanism and the Polish Renaissance is greater for the Polish translations of the Bible (Brzeska and Wujek) than for any other texts analyzed in this study. For these texts, approximately 85% of the attributive adjectives were in the post-position. For the other ecclesiastical texts, the post-position ranged from 48%-57% with the exception of Kazania gnieźnieńskie which had only 37% of the attributive adjectives in the post-position as compared to 57% for Kazania świętokrzyskie. The former text was written in a more informal language than the latter. Poncján, the adventure tale, had 36%, the lowest percentage of post-positions for the literary works. The government treatises, with a range of 40%-52%, ranked next to the religious works. Kochanowski's essays and the paraenetic works with approximately 38% ranked with Poncján. The glosses, with 22%, had the lowest percentage of attributive adjectives in the post-position, but this text is outside the category of formal literature since it is only a list of Latin medical terms and Polish equivalents.

The religious works are formal in style and close to ecclesiastical Latin literary sources, i. e., the Latin Vulgate and church literature. The formal style and ecclesiastical influence largely explain the high percentage of adjectives in the post-position. The government treatises are a formal, high style of literature, but removed somewhat from ecclesiastical Latin literature. Finally, the other texts are more informal in style than the religious texts and government treatises. Thus, the style, formal or informal, and the influence of ecclesiastical Latin literature determine to a great degree the distribution of attributive adjectives in the pre- and post-position in the Polish literature of late medieval humanism and the sixteenth century.

NOTE

*This paper is a condensation of the author's unpublished dissertation of the same title submitted as partial fulfillment of the requirements for the degree of Doctor of Philosophy in Slavic Languages and Literatures in the Graduate College of the University of Illinois at Chicago, 1988.

APPENDIX

Passages from The Holy Cross Sermons and The Gniezno Sermons

Ta słowa pisze mądry Salomon, a są słowa Syna Bożego, tę to świętą dziewicę Katerzynę w sławę, krola niebieskiego wabiącego. (Kazania św., 1934, p. 28)

I mowi ewangelista święty pod obrazem trzy krolew pogańskich: gdzie jeść tet, jenże się narodził krol żydowski? (Kazania św., 1959, pp. 27-28)

(Latin: Ubi est, qui natus est rex Judeorum?)
(p. 27)

Awa tych słow (wykład z języka łacińskiego w polski jeść taki: (p. 30)

Aleć dzisiaj jeszcze pewniejsze nowiny sąc (ony) nam były przez posła niebieskiego przynieszony, ... (Kazania gn., 1953, p. 3) (Kazanie 2)

(Latin: Sed hodie certissime rumores portati sunt per nunciū celestē id est p angelū dñi.) p = per; dñi=domini (Peregrinus, 1481) (Sermo primus)

Iż ci ten to cesarz rzymski coż mu jest było to imię Octavianus dziano, ... (pp. 8-9) (Kazanie 2)

(Latin: Item bene patuit in rege octauiano quando senat' rome voluit eum adorare ...) (Sermo primus)

A przez toć každy krześcijan więcć jest on udarowan niżli ktory krol pogański. (Kazania gn., 1959, p. 41) (Kazanie 5)

Passages from Mikołaj Rej's The Life of an Honest Man

A zowiemy to łacińskim językiem "fatum", to jest wyrokiem a wiecznym dekretem wielmożności Jego. (Żywot) (Rej, 1956, p. 21)

..., także też i w tym porządku ten wszechmogący Pan sprawić i postanović raczył, iż sprawiwszy ty dziwne biegi a ty rozne planety niebieskie, ... (Żywot) (p. 22)

..., ale co napilniej uczyć go czyść a pisać
a po trosze słowa na polski język wykładać, co by
mu ku cnotam a ku poczcziwym obyczajom ono młode
przyrodzenie przywodziło. (Żywot) (p. 37)

Passages from Jan Kochanowski's Prose Works

Jako wszystkie niemal insze narody baśniami więcej
niżli czym pewnym początków swych dowodzą, tak i
polski naród przodków swoich do tej doby nie jest
pewien. ("O Czechu i Lechu") (p. 273)

Naprzód, u żadnego historyka, którzykolwiek
naród słowieński wspominają (prócz tych, mówię, co
od naszych brać mogli), nie znajdują się ci dwa
wodzowie słowieńscy, Lech z Czechem. ("O Czechu i
Lechu") (p. 273)

Czyli nas od wiary latskiej, to jest Łacińskie (bo
sami są greckiej), Łachy zową, a to wedle
etymologijej, bo jako od czeskiej Czech, od
włoskiej Włoch, tak od latskiej wiary Łach wiedzion
być może za tą tych dwu liter, którą między sobą
mają bliskością: s albo ts, a z greckim x, a naszym
ch? ("O Czechu i Lechu") (p. 275)

Zaprawdę, jako słońce światłość swoją traci, gdy za
chmurę zajdzie, tak rozum ludzki od zbytków
tępieje. ("Iż pijaństwo ...") (p. 268).

...--a straciwszy Rzeczpospolitą, nie wiem, jaką
oni chwałę Pańską w swej głowie budują?
("Wróżki") (p. 245).

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LANGUAGE ORIGIN AS CATASTROPHE:
A NEW TURN IN THE LANGUAGE ORIGIN DEBATE

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I would like to begin with some comments on why it is not usual for papers on the subject of the origin of language to be given at linguistics conferences.

The practice of keeping speculation on how language might have originated (and it will forever remain speculation) strictly separate from the science of linguistics proper has its roots in late nineteenth century attempts to codify the procedures which linguistics must follow if it is to be considered scientific. Though it has become traditional to date the banishment of language origin to the founding articles of the Linguistic Society of Paris in 1866, we can more clearly see what was going on at the time in the famous introduction of Osthoff and Brugman of a decade later, designated by Winfred Lehmann as one of four major turning points in the history of linguistics (Osthoff and Brugman 1878; Lehmann 1991). One of the practices discouraged by Osthoff and Brugman was the invoking of special processes to explain "early language" from those used to explain the languages of recent times. In attempting to clean up how linguists deal with proto-languages by limiting them to processes observed in known languages, they effectively made it impossible to explain what processes might have brought language into existence in the first place. It was hard to see how the web of systematic readjustments that occur in fully developed languages could have generated the systems underlying those languages, since their operation presumes that the systems were already present. It was clear by then that a scientific linguistics could not deal with the question of language origin. Besides, whatever events or processes pre-existed language and brought it into existence must, of necessity, be non-linguistic themselves, and thus outside the purview of the field. Thus, there is a sound rationale behind the observation that of the many types of scholars who have commented on the origin of language over the past decades, it has been the linguists who have had the least to say.

Perhaps the best illustration of the gulf separating linguistics from language origin occurred at the 1975 New York Academy of Sciences conference entitled the "Origin and Evolution of Language and Speech" (Harnad et al. 1976). Several prominent linguists were invited to open

the conference with papers on the nature, rather than the origin, of language. Noam Chomsky was among them, presenting his syntactic arguments for the presence of a neurological "language organ" to account for human linguistic ability (Harnad et al. 1976:46-57). When pressed in the question period by Steven Harnad, an organizer of the conference, for an explanation of how such a language organ might have originated, Chomsky evaded the question by saying we should rather ask why people insist on viewing the evolution of the language organ as such a problem -- it would have evolved the way any other bodily organ evolved. In the paper which preceded, he had rather attempted to establish that, if the existence of a "language organ" could be demonstrated on syntactic grounds, any theory of language origin which did not explain its existence (and that included all then-current theories) must be deemed inadequate. For him the "origin" question was a routine biological problem and inherently uninteresting, and thus one which linguists should pass over in silence. Many found this attitude to be rather out of sympathy with the spirit of the conference.

Derek Bickerton in his recent Language and Species explicitly attempts to break that silence (Bickerton 1990). It is not that he is the first linguist to deal with language origin (it was Charles Hockett who initiated the modern debate in the early 60's, and there have been others), he is rather the first scholar of any sort to bring language origin speculation into contact with modern linguistic theory. Regardless of whether we agree or disagree with the many assertions he makes in his book, and there is much to disagree with, Language and Species would deserve our attention if only for the interesting position it occupies in the history of speculation on the topic. For a linguist of avowedly Chomskian orientation to attempt to come to grips with the biological evolutionary implications of the nativist hypothesis is certainly an event worth close observation.

It will, of course be impossible for me to do justice to Language and Species as a whole in this short paper, so I will limit myself to what I believe to be its central argument, contained in the core chapters 5 through 9, and summarize the stages he proposes for the origin of language and the causal mechanisms by which they are reached. Some distortion is inevitable in such a summary, but I will try to present his position as accurately as I can.

Bickerton claims that the study of language origin has been hampered by a lack of solid evidence comparable to the fossils of human paleontology. However, he says that such "fossils of language" do exist in a variety of

currently existing simpler sub-language forms, among which he includes: the "languages" of apes, children under two years of age, Genie, and pidgins. These all have in common that they have many of the more rudimentary elements of language but lack any significant elaboration of grammatical structure such as would qualify them as being "true" language. For this reason they might serve to show us what language might be like in the absence of an innate language mechanism. On the evidence of these linguistic "fossils," he constructs a hypothetical precursor of true language, which he terms "protolanguage," and links this primitive form of language to the technologically stagnant million-year or so existence of *homo erectus*, roughly from 1.2 million to 200,000 years ago.

Protolanguage would contain many of the more rudimentary characteristics of language such as lexicon and simple principles of combination, but would lack what he considers the essential characteristics of true language: hierarchical structure determining the order of constituents, null elements, subcategorized arguments of verbs, mechanisms of phrasal expansion, and the more abstract grammatical items (pp. 122-126). On the basis of analogies drawn mainly from the study of pidgin languages, he claims that to be an adequate precursor of true language protolanguage would have had to have possessed a variety of simple grammatical characteristics such as: negators, question words, pronouns, relative-time markers, quantifiers, modal auxiliaries, and particles indicating location (p. 185). He then proposes that: "... thematic roles, and perhaps even some notion of a hierarchic ranking of roles (at least as far as the supremacy of Agent was concerned) may have preceded the emergence of true language." (p. 187)

Such is the rather rich characterization Bickerton gives to protolanguage. As for the mechanism by which it came into existence, he proposes the following:

Whatever brought them about, the first uses of protolanguage were surely cases of trial and error, error perhaps being more common than success. That would not have mattered. A single success, a single occasion on which the whole group did pay attention to the mouthings of the lucky foragers and did find the otherwise irrecoverable food source, would have been remembered, although not necessarily for long. The beginnings of protolanguage may have been found and lost and found again countless times before becoming firmly established. (p. 155)

In Bickerton's scenario, protolanguage is the hominid communication system in place at the time of a sudden, or "catastrophic," biological change responsible for producing the unique human capacity for complex language. He argues that a gradual appearance of the characteristics of true language is highly unlikely considering how interdependent they are and how suddenly they appear both in the child's acquisition of syntax and in the transition from pidgin to creole languages. On entirely separate grounds, he argues that a catastrophic event is what is needed to explain the rather abrupt acceleration in the rate of human technological change that occurred in the last hundred thousand years or so, made more surprising by the cessation of what had been up to then an accelerating growth in the hominid brain/body ratio. The mechanism he proposes is a single genetic mutation which might have brought about an alteration in the structure of the human brain, possibly bringing together two or more partially developed cognitive systems which in combination would be capable of processing true language. Though the mutation would have had to create the innate language mechanism all at once, its full possibilities may only have gradually been revealed as it interacted with the pre-existing components of protolanguage to produce true language structure. He goes on to suggest a possible link between this mutation and the emergence of *homo sapiens* as a species.

Under the section "Some Problems for the Emergence of Language," he states:

Even with thematic roles and some grammatical concepts in place, one may still feel that the distance between protolanguage and language was immense, too vast to be spanned in a single leap. Language seems to have so much that is missing from protolanguage: infinitely recursive processes; the binding of anaphors and the traces of moved constituents; government, 'proper' as well as ordinary; case assignment; the processes by which null elements are identified; constraints on movement; adjunction, conjunction, and the embedding of constituents; not to mention a host of technical concepts such as 'scope,' 'valence,' 'c-command,' 'm-command,' 'bijection,' 'subjacency,' 'strong and weak crossover,' 'promotion,' 'chomage,' 'quantifier-float,' 'extraposition,' 'exceptional case marking,' 'preposition stranding,' 'chains,' 'parasitic gaps,' and many more that, doubtless to the reader's

relief, will not be discussed here. . . . From where could all these principles and processes have sprung? (p. 188)

He suggests that the variety and complexity of the grammatical rules that have been proposed over the years may have discouraged nativist grammarians from asking "How and why would each of these rules have come into existence, and what kind of genetic mechanism would have ensured their intergenerational transmission?" (p. 189). He argues, however, that the current generative model is far simpler, being limited to theorems to account for: X-bar theory, binding, control, bounding, theta-theory, conditions for government and case assignment, and movement processes. The prospect that a limited set of special cognitive mechanisms could be responsible for these characteristics is far more plausible. He then makes a few tentative suggestions as to how the general nature of such mechanisms may be relatable to known neurological processes. This concludes what I believe to be his central argument. Later chapters are devoted to detailing the consequences of this scenario for the understanding of various human problems.

By now, Language and Species has been quite thoroughly reviewed, and a variety of scholars have had a chance to pass judgement on the profusion of bold assertions which it contains. Bickerton has been accused of, among other things: misunderstanding the Eve hypothesis, ignoring the existence of transitional forms preceding true language, and using reduced forms of existing languages as the basis for protolanguage. No one has thought to mention the problem that if a mutation creates one organism of a new species, that organism would no longer be able to interbreed with its biological population and it would all end there. In any case, what all reviewers seem to agree upon is the untenability of the mutation hypothesis. That a new species, or a new bodily organ for that matter, could arise from a single mutation is certainly the one point which places the greatest strain upon our credulity, and it is unfortunately the crux of his scenario.

The biological problems are not, however, what is most likely to put off linguist readers. More disturbing still may be his confident assumption that the current Government and Binding model is simply the truth about language as we understand it up to now. For anyone who holds one of the many divergent positions, this assumption may appear naive or erroneous and vitiate the whole argument. Also, his treatment of the nativist position as if it were scientific fact is certain to alienate anyone aware of its problematic status as a psychological hypothesis, even if they have no clear

opinion in matters of linguistic theory. In fact, there is a real danger of this work being perceived as a tract of the Chomskian school, as an attempt to provide a prehistoric foundation for the body of beliefs that make up the generative canon -- a sort of Chomskian creation myth.

In my opinion, it would be a serious misfortune if Language and Species were perceived in this way and avoided on purely partisan grounds. The book is far better than that both in the breadth of the material that informs it and in the serious efforts of its author to bring his scenario into conformity with the known non-linguistic facts. I would now like to argue that Bickerton's efforts in the latter direction so dominate his theoretical presuppositions that, even if we were to accept the mutation hypothesis, the scenario he comes up with is much closer to more commonly accepted views than is at first apparent.

No doubt he began the construction of his origin scenario with the mutation idea, which was proposed by Chomsky long ago. But to make the hypothesis plausible, he had to bring it into line with what we know about mutations and their effects, specifically, that there is very little a single mutation can be expected to accomplish in the structural elaboration of an organism. To minimize the "work" that the mutation would have to do, he had on the one hand to propose a rich pre-existing protolanguage to give the newly created brain mechanism something to operate upon, and on the other he had to endow the affected organism with a set of pre-developed cognitive capacities which needed only to be brought into contact by a single structural change in the brain.

The ultimate effect of Bickerton's attempts to make the mutation theory plausible is inevitably to de-emphasize the role of the crucial mutation. But under such strongly predisposing conditions, could the mutation now be said to have caused the development of the essential structure of language? Was not the rather richly endowed protolanguage developed by *homo erectus* as much the cause of language structure as the mutation? Were not the pre-existing cognitive systems, developed no doubt in the practice of non-linguistic skilled activities, as much the cause of true language as the mutation that linked them?

The real problem here is that it is impossible in our current understanding of biological evolution, even in its recent punctuated-equilibrium varieties, to say that mutations cause evolutionary changes. The evolutionary process is an interactive one between organism and environment. The most a mutation can do is make a simple alteration in the genetic material of an organism; for an evolutionary change to result the

alteration must interact with the existing structures of the organism, with the patterns of behaviour in which these structures take part, and with the environment in which these behaviours are performed. The end result must be some reproductive advantage for the organism. Through their selecting effects, existing structures and behaviours are as important in the causation of evolutionary change as mutations are, whose primary role is to provide extra variation for them to operate upon.

No doubt there were many mutations which took place in the hominid germ plasm that had directly or indirectly to do with our present species-specific linguistic ability. Those involved in the cognitive changes which made it possible for *homo erectus* to invent protolanguage, however stumblingly, and those connected with the development of the cognitive abilities which came together to make possible true language, all may be said to have participated in the causation of true language.

But even if we accept Bickerton's scenario, we are forced to admit that an invented protolanguage had as much of a role in the causation of true language as any mutation did, and that a variety of cognitive abilities developed in the performance of various non-linguistics activities contributed to the innate language mechanism. A neurological mechanism which may have been a biological adaptation to a cultural innovation, and might have amounted to a combination existing cognitive abilities, is something essentially different from the "language organ" envisioned in the original nativist position. I think it is to Bickerton's credit that, in his honest attempt to bring the nativist hypothesis into line with scientific fact, and so, in the spirit of Osthoff and Brugman, to limit the tools of explanation to observed processes, he has effectively made it disappear.

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IX

LITERARY AND TRANSLATION STUDIES

SHAKESPEARE'S USE OF METAPHOR IN *KING LEAR*: HIS INGENIOUS TRANSFUSION OF SOURCE MATERIAL

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Introduction

Shakespeare's use of metaphor — the highlight of his genius reveals not only Shakespeare the artist but also Shakespeare the man, the human being, his profound understanding of human nature in the macrocosm-microcosm relationship. The dynamics and beauty of the animal imagery in *King Lear* (Shakespeare 1607/1608) exemplify the grandeur of his creative vision. Here he creates metaphor to dramatize his tragic vision of universal evil issuing from the cruelty and treachery of man rendering him comparable to the ferocious beast and contrary to nature and to humankind. Thus the extraordinary concentration of animal references in *King Lear* and the intensity of the animal imagery to emphasize the unkindness and bestiality of Goneril and Regan and of Gloucester's son Edmund (Bradley 1904/1955: 213-215; Knight 1957: 180-186, 205; Spurgeon 1935: 338-342; Heilman 1948/1963: 92-98, 104-107; Evans 1962/1966: 171-172; Armstrong 1963:72-73).

Shakespeare is indebted to the anonymous old play *The Chronicle History of King Leir* (A 1594/1605) — the main source of his *King Lear* — for his central theme rooted in filial ingratitude dominant in both plays (Nameri 1976: 2 vols.). The striking image he found in *Leir* of the self-sacrificing pelican analogous to the parent-child relationship appears both in *Leir* and in *King Lear* but in reverse representation of the image. The image derives from an early 13th c. fable written in Latin by Odo of Cheriton (or Sherston, d. 1247), a preacher (Hervieux, ed. 1893-1899, 1965 (?); Stephan and Lee, eds. 1917: XIV, 874). Cheriton's Latin text may be paraphrased as follows (see end-note 1):

The pelican kills its young chicks when these raise their beaks to peck it. Then, on seeing them dead, and moved by pity, it draws blood from its own side, sprinkles it over them, and they return to life.

Cheriton then draws an analogy:

In the same way, God, who when Adam and Eve disobeyed him by eating of the forbidden fruit, condemned them to death. Then, moved by pity, He allowed blood and water to be drawn from His side, and through baptism and His own blood offered salvation to mankind.

The pelican image in *Leir* is evoked when, subsequent to the love-test of his daughters, Leir, infuriated by Cordella's simple profession of filial love, rejects her and orders her banishment. In his arrogance and doting pride he refuses to reverse his adamant judgment denying any opposition:

Leir. Cease, good my lords, and sue not to reverse
Our censure which is now irrevocable....

I am as kind as is the pelican

That kills itself, to save her young ones' lives.

(A 495-505. My italics)

The emphasis here is on Leir, the kind father, analogous to the life-giving, self-sacrificing parent pelican. Shakespeare, however, places Lear's emphasis on his elder daughters whose unnatural cruelty had driven him out into the torrential storm. The pelican image evoked here is rather that of the life-taking, blood-draining pelican offspring. Thus, Lear, on seeing poor Tom shivering in the cold slashing storm identifies with him in his wretchedness and cries out in anguished dismay:

Lear. Death, traitor, nothing could have subdued nature
To such a lowness but his unkind daughters.
Is it the fashion that discarded fathers
Should have thus little mercy on their flesh?
Judicious punishment! *'twas this flesh begot*
Those pelican daughters.

(*SH*.iv.68-73. My italics).

Lear, in achieving insight through suffering sees in the cruelty of his daughters the wages of his initial sinfulness. This parallels Lear's sense of guilt when, bewildered by the incredibly unnatural cruelty of Gonorill, he accepts it as due punishment for his "heavy sins .../Else aged Lear them could never find/Cruel to him, to whom he has been kind" (A840-842). The pelican image suggested here by Lear is further developed in his despairing protestations to Perillus against these daughters who, contrary to the elements of "nature's sacred law,.../Do now reject, condemn, despise, abhor me" (A882-889).

Analysis

The 'straight' pelican-Leir analogy that appears early in the old play (A501-502) is accentuated at a later point in the play by Lear's devoted follower and counselor Perillus (Shakespeare's Kent) in his bitter outcry:

Per. O viperous generation and accursed
To seek his blood, whose blood did make him first.
(A1601-1602).

Shakespeare, it appears, derived from the hint he found in the old play the central image of the pelican for his tragic representation of the sinfulness of filial ingratitude - incarnation of all-embracing evil. This, with its repercussions runs like a leit-motif throughout the two plays with Shakespeare elaborating on hints he found in the old play, intensifying his animal imagery to reflect the gruesome image of filial ingratitude in wicked defiance of the sacred law of nature (See end-note 2).

Lear's treacherous daughters Gonorill and Ragan who "had set a shag-haired murdering wretch/To massacre my honest friend and me" (A 2185-2209), had "practised treason 'gainst their father's life" (A 2442) are further identified with the venomous viper - symbol of deadly treachery - and with the contemptible toad. This image of the viper may have given rise to Shakespeare's striking references to "serpent" and "adder" in relation to Goneril and Regan and to "toad" in relation to Edmund. Thus, Lear's outcry in passionate contempt to Ragan before the crucial battle:

Lear. Out on thee *viper*, scum, filthy parricide,
More odious to my sight than is a *toad*.

(A 2513-2514. My italics)

and the contained ire of faithful Perillus bursting out on Gonorill:

Per. Nay, peace thou *monster*, shame onto your sex,
 Thou *fiend* in likeness to a human creature
 (A 2510–2511. My italics)

is echoed in Albany's fierce reprimand of his wife Goneril:

Alb. See thyself, devil!
 Proper deformity seems not in the *fiend*
 So horrid as in woman....
 Thou changed and self-cover'd thing, for shame,
Be-monster not thy feature....
 ... thou art a *fiend*,
 A woman's shape doth shield thee.
 (SIV.ii.59–67. My italics)

Both in the old play *Leir* and in Shakespeare's *King Lear* the central system of images derives from the idea inherent in the pelican symbol, initiated by the anonymous dramatist and adopted by Shakespeare. In both plays animal imagery focuses on the bestiality of filial ingratitude. Drawing on this meaningful symbol Shakespeare creates a complex, intensified system of images to reflect the irrational and inhuman cruelty embodied mainly in Goneril and Regan merciless and devoid of compassion to the end and in Edmund. The image of the tortured Lear and his weaker counterpart Gloucester merges and becomes one with that of wild universal convulsion envisaged in the cruelty and wild fury of beasts and birds of prey, in tempestuous storm and in madness when mind and matter are wrenched asunder.

Lear first experiences the evil inherent in filial ingratitude when he senses "a great abatement of kindness" to him and "neglect" in Goneril's household (SI.iv.57–58, 65). His violent quarrel with Goneril (SI.iv) concludes with his wrathful declaration to leave this "degenerate bastard" (SI.iv.247) whom he now perceives as the embodiment of evil ingratitude — "thou marble-hearted fiend,/More hideous when thou show'st thee in a child/Than the sea-monster" (SI.iv.253–255), whose stroke is "sharper than a serpent's tooth" (SI.iv.282). Regan's attempt to persuade him to return to Goneril is firmly resisted:

Lear, Never, Regan,
 She hath abated me of half my train;
 Look'd black upon me; *strooke me with her tongue*,
Most serpent-like, upon the very heart,
 (SII.iv.154–157. My italics)

He would rather "be a comrade with the wolf, and howl/Necessity's sharp pinch!" (SII.iv.205–208) than return to her.

The serpent image is also evoked in the Gentleman's tale to Kent of Lear's "heart-strook injuries" (SIII.i.17) inflicted by Goneril, "This gilded serpent" (called so by Albany (SV.iii.85)) and her no less vicious sister. To the "serpent-like" nature of Goneril is added that of the rapacious nature of the beast of prey. Thus, she is a "detested kite" (SI.iv.256), her face is of a "wolvish visage" (SI.iv.302), "her eyes are fierce" (SII.iv.169), her teeth are like the "fangs" of the beasts of prey and the venomous snake (SIII.vii.57), and in all her "unkindness" is "Sharp-tooth'd, ... like a vulture" (SII.iv.131).

The storm into which Lear rushes out assumes now the image of an unleashed animated power — cruel, fierce and merciless, at one with the wild beasts and the two "pernicious daughters". It is compounded of "fretful

elements", "impetuous blasts, with eyeless rage ... and fury", "to-and-fro conflicting wind and rain" (SIIL.i), "sulphurous and thought-executing fires," "oak-cleaving thunderbolts" and "all-shaking thunder" (SIIL.ii). It "blows", "cracks", "rages", "rumbles", "spits" and "spouts" (SIIL.ii). This is a night

... wherein the cub-drawn bear would couch,

The lion and belly-pinched wolf

Keep their fur dry,

(SIIL.i.12-14)

Yet, this "contentious storm" and "tyrannous night" are less painful to Lear, less shattering than the tempest raging within him. The offence of filial ingratitude is excruciating.

Lear. ... filial ingratitude! ...

In such a night as this? O Regan, Goneril!

Your old kind father, whose frank heart gave all.

(SIIL.iv.14-20)

At the core of this grievous utterance we find Lear's lament when he and Perillus are on French soil in search of Cordella. The same pelican image is again reiterated:

Leir. Ah, Gonorill, was half my kingdom's gift

The cause that thou didst seek to have my life?

Ah, cruel Ragan, did I give thee all,

And all could not suffice without my blood?

(A2074-2077)

In the course of the mock trial (SIIL.vi) the vile offences of his "dog-hearted" daughters (SIV.iii.45) are again brought into relief. As he calls to arraign these "she-foxes", he first refers to Goneril — her pelican ingratitude:

Lear. Arraign her first; 'tis Goneril. I here

take my oath before this honourable assembly,

she kicked the poor king her father.

(SIIL.vi.45-47)

He then turns to Regan "whose warp'd looks proclaim/What store her heart is made on" (SIIL.vi.51-52). He would search for the causes of evil there, within her heart, and he orders to "anatomize Regan" (SIIL.vi.74-76).

The horrifying cruelty of "Those pelican daughters" reaches its climax in the scene of the plucking out of Gloucester's eyes (SIIL.vii), suggested by Goneril, acquiesced by Edmund who had "informed against him" (SIV.ii.92), and executed by Regan and Cornwall. For Gloucester had sent Lear to Dover instead of committing him to the violent hands of his daughters.

Gl. Because I would not see thy *cruel nails*

Pluck out his poor old eyes nor thy *fierce sister*

In his anointed flesh stick *boarish fangs*

(SIIL.vii.55-57. My italics)

Shakespeare's emphasis throughout is on the image of savage, bestial sharpness — the serpent's tooth, the boorish fangs, the cruel nails, the vulture's teeth, the "sharp pinch" of necessity, treason's tooth — to accentuate both the cruelty of these unfilial daughters and the sharpness of the pain and suffering they had inflicted on their father.

The image of the pelican underlies the fierce outcries of both Perillus and Albany — moral speakers against the sinfulness of filial ingratitude — with Albany echoing the former. Thus, the essence of Perillus's outcry:

Per. Oh iron age! O times! O monstrous, vilde,
When parents are contemned of the child!

(A 747-748)

is contained in Albany's fierce denunciation of both daughters:

Alb. O Gonerill!

You are not worth the dust which the rude wind
Blows in your face. I fear your disposition;
That nature which condemns its origin
Cannot be border'd certain in itself; ...
Tigers, not daughters, what have you perform'd?
A father, and a gracious aged man,
Whose reverence e'en the head-lugged bear would lick,
Most barbarous, most degenerate! have you maddened.

(SIV.ii.29-43)

Albany's incensed upbraiding further echoes the bitter cry of Perillus when the Messenger-murderer shows him and Leir Gonorill's letter ordering their murder:

Per. O just Jehovah, whose almighty power
Doth govern all things in this spacious world,
How canst thou suffer such outrageous acts
To be committed without just revenge?
O viperous generation and accursed,
To seek his blood whose blood did make them first.

(A 1597-1602. My italics)

Alb. If that the heavens do not their visible spirits
Send quickly down to tame these vilde offences,
It will come,
Humanity must perforce prey on itself,
Like monsters of the deep.

(SIV.ii.46-50. My italics)

Filial ingratitude in the sub-plot of *King Lear* parallels that of the main plot but is not as sharply focused. Edmund seeks ultimate power at all costs including the betrayal, torture and life of his father. Before the crucial combat Edgar summarizes in cool, rational denunciation:

Edg. ... thou art a traitor,
False to thy gods, thy brother, and thy father,
Conspirant 'gainst this high illustrative prince,
And, from the extremest upward of thy head
To the descent and dust below thy foot,
A most toad-spotted traitor.

(SV.iii.134-139. My italics)

Edgar's earlier declaration of his anonymity, his "name lost; /By treason's tooth bare-gnawn and canker-bit" (SV.iii.122-123) again images filial ingratitude as a devastating treacherous monster.

Let us now return briefly to *Leir* where we find Cordella, accompanied by Gallia, bewailing her separation from her father. She will accept no consolation, but continues to explain her natural love and devotion to her father. This is reaffirmed later by Perillus when he counsels Leir to seek the help of Cordella, whose "love unto you was as much,/As ought a child to bear unto her father" (A1718-1719. Compare Cordelia's simple and honest assertion of her love for her father, "according to my bond;" *King Lear* I.i.91-92, 94-103). Thus Cordella:

For what can stop the course of nature's power?
 As easy is it for four-footed beasts,
 To stay themselves upon the liquid air,
 And mount aloft into the elements,
 And overstrip the feathered fowls in flight:
 As easy is it for the slimey fish,
 To live and thrive without the help of water;
 As easy is it for the blackamoor
 To wash the tawny color from his skin,
 Which all oppose against the course of nature,
 As I am able to forget my father.

(A1232-1242. See end-note 3 and Bullough
 1973:VII, 302 on nature in *Leir*, 302-304 and on
 nature in *King Lear*)

When Cordelia prays to restore Lear with her love she recapitulates the theme of Goneril's and Regan's wicked abuse of their father, "those violent harms" they had inflicted upon him and the suffering and degradation, both physical and moral that he had undergone:

Cord. O my dear father, restoration hang
 Thy medicine on my lips, and let this kiss
 Repair those violent harms that my two sisters
 Have in they reverence made! ...
 ... Was this a face
 To be opposed against the warring winds?
 To stand against the deep dread-bolted thunder?
 In the most terrible and nimble stroke
 Of quick, cross lightning? ...
 ... Mine enemy's dog,
 Though he had bit me, should have stood that night
 Against my fire; and wast thou fain, poor father,
 To hovel thee with swine and rogues forlorn,
 In short and musty straw?

(SIV.vii.30-39)

The image here of burning pain conveyed by "the most terrible and nimble stroke/Of quick, cross lightning" repeats the image of Goneril's tongue striking like a serpent (SII.iv.156-157) and inflicting on Lear "heart-strook injuries" (SIII.i.17). Again, we have the effective use of animal references — "Mine enemy's dog", "swine" to image the unnatural state to which Lear has been reduced by his ungrateful daughters. We find a similar image in Edgar's tale of degrading persecution incurred by his brother upon their father and himself when, forced to escape, he had shifted "Into madman's rags, t'assume a semblance/That very dogs disdain'd; and in this habit/Met I my father with his bleeding rings,/Their precious stones new lost," (SV.iii.188-191).

Lear's last reference to animals no longer sounds the note of passionate anger, vindictiveness, denunciation, enmity or abuse. It issues from the heart-broken Lear as he bends over the dead body of Cordelia.

Lear. And my poor fool is hang'd! No, no no life!
 Why should a dog, a horse, a rat, have life,
 And thou no breath at all?

(SV.iii.306-308)

Nothing else exists. Concentration is wholly on his loved one. No longer

does he speak of fierce, treacherous beasts and wild, cruel nature with whom he had formerly identified his evil daughters. Now we hear of the common domestic animals — the dog, the horse, the rat — generally associated with the humble life of common humanity with whom the once arrogant, proud and pompous king now, in humility, identifies.

The animal references in *Leir* are more than merely rhetorical expressions used for dramatic effect. For the anonymous dramatist succeeds in his own mild way in conveying the central theme of filial impiety. The repeated references to "viper", "toad", "fiend", "monster" in *Leir* evolve from the image of the pelican daughters. The "eagle" (504) and the "peacock" (279) are associated, respectively, with Leir's early doting arrogance and pride, and with Cordella's pride indicated as such by her envious sisters who would "clip her wings for mounting up too high" (476).

There is also the wondrous "Phoenix" (1243), image of the beauty and perfection given to Cordella. We note the reference to the "dung cart" drawn by "a scavenger's horse" (995), and the "flea" (1184) — revolting images related to the abhorrent Messenger-murderer. There are, too, the "parasites" (745) of Gonorill and Ragan, in league with these daughters in their persecution of their father, and the treacherous "cat which dallies with the mouse,/And on a sudden makes her a prey" (1509-1510), imaging the villainy of the Messenger-murderer. For dramatic relief, we have a refreshing image of the "willing horse" (2337) associated with the staunch Mumford, and there is the "ass" (2381), referring to the humorously stupid watchmen whose folly resulted in the defeat of Leir's enemies.

Conclusion

The animal references in *Leir* appear to have been more than a hint for Shakespeare's prolific powers of imagination and creativity. Animal imagery in *Leir* does not assume as central and organic a function as it does in *King Lear*. It is rather static, devoid of that vital pulsebeat which in Shakespeare's play merges image and model to conceptualize the ethos of the drama. We do not discern in the old play a dramatic change in animal imagery, for example, to convey a sense of peace, calm and joy in Leir's reconciliation with Cordella, his restoration to kingship and to prospects of a happy old age. Nor do we find in *Leir* the dialectic aspect of animal imagery which Shakespeare interweaves with the 'straight' comparisons of man and beast to suggest the ideal to which man ought to strive. Thus we are given the image of animals which in their own animal nature obey a higher law than base man or at least, are less totally vicious, and can thus serve as contrast to man's depravity. Man is thus imaged as *less* than beast. For example, filial ingratitude is "more hideous.../Than the sea-monster" (SI.iv.253-255); even "a snail has a house" (SI.v.276); Lear would "rather ... be a comrade with the wolf" than return to Goneril (SII.iv.205-207); the "degenerate" daughters have barbarously abused "A father, and a gracious aged man,/Whose reverence e'en the head - lugg'd bear would lick" (SIV.ii.41-42). The anonymous dramatist sustains to the very end the same unvaried image of the viper, the monster, the fiend and the toad given throughout the play to the inhuman daughters.

Shakespeare is the debtor, but in his use of animal imagery he deviates markedly from the anonymous dramatist. He takes up, for example, the latter's oft-repeated image of the "viper" related to Gonorill and Ragan and

transmutes it into a powerfully animated and multifarious image of the evil they represent which is also likened to the cruelty, the treachery, and the vicious nature of the "fiend", the "sea-monster" the "serpent" and the "roaring sea". The anonymous Gonorill is a "viper", indeed, but Shakespeare expands and vitalizes the image so as to convey more fully the sense of the diffusion of this noxious, preying evil. And he creates a monstrous Goneril, cruel and fierce, and akin to the "wolf", the "serpent" and the "boar" at the height of their ferocity. Again, Shakespeare adopts from *Leir* the image of the "pelican" but adds to the unkindness of "those pelican daughters" the characteristic qualities of birds of prey — the "detested kite" and the "sharp-tooth'd vulture". And it complements the image of Goneril's cruel "tongue" which strikes "Most serpent-like upon my very heart." We are given the image of the beast — cruel and fierce, and in devastating action — biting, striking, roaring, flaying, gnawing, preying. It is Lear's image of the inhuman cruelty of his daughters.

The Learean world is now overrun by the beast of prey, image of monstrous inhuman cruelty. We have a wild and terrifying array — the pelican, the sea-monster, the adder, the serpent, the kite, the wolf, the vulture, the bear, the lion, the dragon, the boar, the tiger, monsters, the "enemy's dog", the "ditch-dog", and the repulsive swine, hog, mice, rats, fox, frog and toad. Beast, storm, and madness unite organically to image the tremendous force of Evil in nature, now assuming universal proportions, with which Man — Lear — is found contending. We witness the dialectic of this contention, and the grand manifestation of the magnanimity of Man in his capacity for suffering and enlightenment. For Lear emerges, in spirit, triumphant and superior to the Evil in nature which was out to destroy him.

In *King Lear*, and resplendently in deviation from *Leir*, we are presented with the glory of Lear's moral victory, envisaged, too, through animal imagery. Lear's reconciliation is like the calm that sets in after the raging storm, and there is peace, harmony and love. Then there is a further convulsion, the battle, after which we follow Lear and Cordelia to prison. And now we experience an exhilarating turn of sentiment, for instead of being thrown into utter dejection we are uplifted by the sublimity of Lear's expression of bliss — bliss in the mere nearness of his daughter, of her very being. He envisions a life of immeasurable happiness with her — there, within the prison walls, where "We two alone will sing like birds i' th' cage" (SV.iii.9). We are given here, instead of the preying kite and the vulture, the image of a bird singing — singing despite its captivity, and thus *superior* to it. Here, too, we have "gilded butterflies" (SV.iii.13), rather than the lecherous "gilded fly" (SIV.vi.111) and the "gilded serpent" (S.V.iii.85). There is a bliss here that obliterates former suffering, and the renunciation of the world of material values assumes the nature of "sacrifices" upon which "The gods themselves throw incense" (SV.iii.20-21).

We are lifted out of the atmosphere of darkness and gloom where Evil and cruelty reigned, and immersed in an atmosphere dominated and ennobled by Goodness and Love. We are given this before the last bitter stroke — Cordelia's death. But here, too, the governing principle is that of the Lear-Cordelia world in which we are no longer haunted by the ravaging beast. We hear only of the dog, the horse and the rat — a domestic image embraced by common humanity. Then there is peace, and a relief in Lear's last cry of bliss: "Look on her, ... look, ... her lips, ..." (SV.iii.310). (Bradley 1955(1904): 233-234).

The manner in which Shakespeare employs the sparse animal references he found in the anonymous *Leir* constitutes an enhancing example of how his phenomenal imagination, complemented by his ingenious use of language, transfuses the material that he works with. Transmitting an understanding of this significant aspect of Shakespeare's artistry — inevitably an integral part of the teacher's task — is vital in enlightening the act of interpretation and/or of literary criticism and appreciation.

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End-Notes

1. See Odo of Cheriton, "DE PELLICANO, Et applicator passioni C(h)risti" in Léopold Hervieux, ed., Vol. IV (Paris, 1893–1899), facsimile copy of first ed. (New York, 1965(?)), LVII, 229. See *A Dictionary of National Biography: From the Earliest Times to 1900*, ed. Sir Leslie Stephan and Sir Sidney Lee. 22 vols. (London, 1917–), Vol. XIV on Odo of Cheriton, "fabulist and preacher", who completed his sermons on the Sunday gospels in 1219. Cheriton,

Like other preachers of his time introduced into his sermons a large number of 'exempla', or tales, drawn from various

sources to illustrate his arguments, or perhaps at times only to attract the attention of his hearers (p. 874).

We are informed that Cheriton's collection, "usually known as the 'Parabolae', or fables of Odo...exists in a vast number of manuscripts of the thirteenth to fifteenth centuries in the libraries of England, France, Germany and other countries" (p. 874). It is possible that Cheriton's fables were available to the Elizabethans in manuscript form. They may also have been repeated in Sunday sermons and thus rendered familiar to church-goers.

2. Shakespeare also uses the image of the pelican in *Richard II* (1597) and in *Hamlet*. In *Richard II*, as in *King Lear*, young pelicans are symbols of harsh filial ingratitude. Thus, we hear John of Gaunt accusing Richard of responsibility for Gloucester's murder:

Gaunt (to Richard). *That blood already, like the pelican,
Hast thou tapped out and drunkenly caroused.*

(*Richard II*, II.i.126-127. my italics)

In *Hamlet*, however, Shakespeare uses the pelican as symbol of kindness and generosity, as it is first represented in the anonymous dramatist's *Leir* (A501-502). Thus Laertes answers the King who questions him about his enemies and whether he will have revenge on all for his father's death:

Laer. To his good friends thus wide I'll open my arms;
And, *like the kind life-rendering pelican,*
Repast them with my blood.

(*Hamlet*, IV.v.141-143, my italics).

3. We note here the image of birds in flight on high which may have suggested a hint for Shakespeare's numerous references to birds of all kinds — the vulture, the wren, the chough, the kite, the hedge-sparrow, the cuckoo, the owl, the lark — and, especially, for Edgar's eloquent description to his blind father of the view from the "dizzy" heights of Dover cliff (SIV.vi.11-24, 57-59).

VIR AND *HOMO* IN CICERO'S PRO MILONE

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Introduction

Titus Annius Milo and Publius Clodius Pulcher were rival politicians in the dying days of the Roman republic. They both sought to attain their ends through the employment of armed gangs of followers, who could harass and intimidate other statesmen, dominate or break up public meetings, and create general turmoil when it was to their leader's advantage. Naturally, the two factions also fought brawls against one another. In 53 BC, Milo and Clodius, each attended as usual by a number of retainers, met by accident on a highway outside of Rome. A set-to ensued, Clodius was wounded and hid himself in a nearby tavern, and Milo sent after him several men who finished him off.

Due to the unsettled political climate of the times, Milo was not arraigned for this crime until the following year. He then retained as counsel for the defense Marcus Tullius Cicero, Rome's most outstanding orator and himself a longtime enemy of Clodius. Cicero had a difficult case to plead, insofar as ordering one's followers to hack a defenseless man to death clearly constituted guilt of murder. The orator decided to advance two main arguments: first, he would claim that Clodius had set an ambush for Milo, hence Milo's dispatching of him was a legitimate act of self-defense; second, he would claim that Clodius' murder was an act that merited praise, not punishment.

The second of these lines of defense plainly rested on a more basic claim, namely that Clodius was evil while Milo was good. Less obviously, the claim of self-defense rested on the same basic thesis. Given the animosity between Clodius and Milo, it was a reasonable, though false assumption that they had not met by accident on the day of Clodius' death, but that one of them had set an ambush for the other. Cicero hoped, by ignoring in his speech the possibility of an accidental meeting, to make the jury forget that possibility, leaving them only to decide, on the assumption that there had been an ambush, which of the two principals was the wicked sort of person who would lay such a perfidious trap. Hence the necessity of emphasizing Clodius' wickedness and Milo's nobility.

One of the numerous overt and covert devices employed by Cicero in support of his dualistic characterization of victim and defendant is his use of the words *vir* and *homo*, both usually translated simply as 'man', with the understanding that the former is gender-specific while the latter is equivalent

to 'adult human being'. In fact, there is far more to the definition of each word, and to the distinction between them, than is usually recognized by modern scholars, so that in these two words Cicero had available a ready resource for characterizing two radically different sorts of man.

The Meanings of *vir* and *homo*

The unabridged Oxford Latin Dictionary lists the basic meaning of *homo* as 'a human being (of either sex)'. The OLD thus implicitly maintains that the use of *homo*'s descendants in various Romance languages (*homme*, *hombre*, etc.) to mean 'adult male' is a postclassical development. *Homo* is also listed as having a number of subsidiary definitions, such as 'mortal', in implied or explicit contrast with the gods. However, such special uses of the term need not concern us further here.

As for *vir*, whose basic meaning is given as 'adult male', it has several special senses which are cited as extensions from its root meaning, of which two are particularly important. One of these emphasizes the notion of maleness in paired contrast with femaleness, from which extension comes the further refinement to 'bridegroom' or 'husband'. The other important special sense derives from the fact that to the Roman mind, an adult male of good character was the epitome of virtue; indeed, the very word *virtue* (Latin *virtus*) etymologically means 'the quality of being a *vir*'. Thus, *vir* can be used to emphasize not just the maleness of a referent with an implied or overt contrastive connection to femaleness, but alternatively, his courage, self-discipline, devotion to duty, and general uprightness as an man.

There is still more to be said about the actual use of *vir* and *homo* than even an unabridged dictionary records. The poems of Catullus, Sallust's historical monograph Catilina, and Book I of Cicero's Letters to Atticus constitute a sampling of representative texts from different genres during the late republican period. Examination of these texts reveals that, although the plural *homines* can be used to refer to a mixed group of males and females, *homo*, when used in the singular, always indicates a male. Thus, it is not true that *homo*, in the singular, can be translated as 'human being'. Rather, *homo* is the unmarked lexical item meaning 'adult male'. It follows, then, that *vir* must be a marked form, the use of which calls attention to some specific feature of the adult male in question.

This markedness analysis is supported by the relative frequency of occurrence of *homo* and *vir* in the representative texts. In Catullus' lyric poetry, *homo* is used 27 times and *vir* either 26 or 27, depending on how we reconstruct the defective text of lxiii.63. Of these instances of *vir*, a large number occur in wedding songs in which 'groom' and 'husband' naturally come up frequently. In Book I of the rather colloquial, non-literary Letters to Atticus, *homo* occurs 39 times, *vir* only 6. Lastly, there are 37 occurrences of *homo* in the Catilina, as compared to 16 of *vir*. Overall, occurrences of *homo* far outnumber those of *vir*, the total for the three texts being 103 of the

former and 48 (or 49) of the latter.

The question then arises, what, specifically, are these authors attempting to indicate when they use *vir* rather than *homo*? To restate, the special senses of *vir* fall into two main groups, those which emphasize maleness, including the use of *vir* to mean 'husband' or 'bridegroom', and those which emphasize manly virtue. In Catullus, 23 (or 24) of the 26 (or 27) occurrences of *vir* fall into the 'male' group, leaving only two instances in which 'virtue' is emphasized, plus a single use (lxiv.192) which falls into neither category. The infrequency of the former category is not surprising in Catullus, given his un-Roman lack of interest in even paying lip service to manly virtue. As for the frequency of the latter, husbands, wives, and marriage are common topics of Catullus' poetry; of the 23 (or 24) occurrences of *vir* as 'male', fully 20 are uses in the special, restricted meaning of 'husband' or 'bridegroom'. Indeed, nine of these instances are found in just two of the 116 poems which constitute the corpus, namely lxi and lxii, which are both wedding songs.

In Catullus, then, *vir* occurs fairly frequently, as compared with the other representative texts, because of his focus on marital issues. In the other two texts, *vir* occurs much less frequently relative to *homo*, and it usually does not mean either 'husband' or 'man as opposed to woman'. In Book I of his *Letters to Atticus*, Cicero uses *vir* as 'true man, hero' five times, and as 'male' only once. In the *Catilina*, the count is 11 heroes to four males, plus one example which fits neither category. Neither of these texts is much concerned with marital issues, hence the predominant function of *vir* is the indication of manly virtue. It is noteworthy that Sallust, who is writing a literary account of affairs of state, uses *vir* more frequently in relation to *homo* than does Cicero in his letters, which, even when they concern contemporary politics, are personal communications in which striving for rhetorical effect is less significant than in history writing.

Examination of these texts has refined our understanding of the meanings of *vir* and *homo*. *Homo* is the unmarked, colorless word used to mean 'adult male'. *Vir*, when it is not plainly to be understood as 'husband' or as 'male', generally carries a connotation of heroism, fortitude, uprightness, in short, to use the Latinate word, of virtue. The use of *vir* in this sense may have been uncommon in colloquial usage and in literature of non-traditionalists such as Catullus. However, in the formal setting of a trial for murder, with an all-male jury chosen from the traditionalist, patriotic ruling classes of Rome, the use of *vir* in this commendatory sense would hopefully have a largely subconscious but nevertheless powerful effect on the jurors' opinions about the characters of individuals in the case.

vir and *homo* in the Pro Milone

A count of the occurrences of *vir* and *homo* in the *Pro Milone* reveals 51 instances of the former versus only 36 of the latter. The inversion of relative frequency plainly reveals that Cicero is up to something: one does not

use *vir* so often without cause. Table I, below, details the instances of use of each word with positive connotation in the speech. Also included in Table I are the words *virtus*, which according to previous arguments should be used only positively, and *civis* 'citizen', another term of approbation is Cicero's idiolect.

Table I. Instances of Positive Reference

REFERENT	<i>vir</i>	<i>homo</i>	<i>virtus</i>	<i>civis</i>
Milo and men compared to him	18	3	10	6
Pompey	5	2	3	0
various specific good men	13	1	1	5
generic good men	5	0	0	1
jurors	5	0	2	1
soldiers at the trial	1	0	0	0
Clodius' retinue	2	0	0	0
enemies of Clodius	1	0	0	1
Roman citizens in general	0	0	0	11
other positive uses	1	3	2	3
Clodius (ironic reference)	0	0	0	1
total positive uses	51	9	18	29

Several items in Table I deserve comment. First, Pompey was Rome's chief magistrate in 52 BC and the man under whose auspices the trial had been arranged, hence a man well worth complimenting. Likewise, Cicero was an experienced lawyer and knew the value of addressing and referring to the jurors as *viri* or *cives* rather than mere *homines*. This being a highly politicized trial, there were soldiers in attendance to ensure order, but since, if they chose to, these soldiers could intimidate witnesses and jurors, it was well to refer to them by the complimentary term *viri* as well. And naturally, anyone who was an enemy of Clodius was, in Cicero's opinion, obviously a fine person.

While Milo is referred to as *vir*, *civis*, and possessor of *virtus* more than any other individual, Clodius is never once called a *vir*, and is only referred to as a *civis* once, in an ironic passage in which Cicero also mockingly describes the dead man as kind, wholesome, and gentle, the idea being that, just as Clodius actually displayed none of those characteristics, so was he also no true citizen of Rome. The two references to Clodius' henchmen on the day of the

murder as *vir* need explanation: Cicero is characterizing the men, not as noble fellows, but at least as bold, hardy warriors, just the sort of men Clodius would have used to set an ambush.

Instances of negative reference for each of these four words are detailed in Table II, below.

Table II. Instances of Negative Reference

REFERENT	<i>vir</i>	<i>homo</i>	<i>virtus</i>	<i>civis</i>
Clodius	0	6	0	0
adherents of Clodius	0	4	0	2
gladiators/criminals	0	2	0	0
bad citizens in general	0	0	0	2
a hypothetical fearsome citizen	0	0	0	1
total negative uses	0	12	0	5

As Table II makes clear, Cicero uses *homo* to refer to those he disapproves of as freely as he uses it positively. *Vir* and *virtus*, however, he restricts entirely to those he characterizes as good. A Roman *civis*, on the other hand, although presumptively a good man, is not necessarily so. Thus *civis* is used negatively five times, which is still far fewer than the 29 times it is used positively.

We should note before continuing that *homo* also occurs 15 times in neutral reference, usually in the set legal term *homo occisus* 'homicide victim', otherwise referring to humanity in general or mortal humans as opposed to gods. The other three terms under consideration are never used neutrally.

The same pattern of connotation found by matching words with referents shows up in adjectival modification of the words in question, leaving out *virtus*, which does not typically receive any positive or negative modification. Table III, on the following page, characterizes the adjectival modification of *vir*, *homo*, and *civis*.

Viri, the table indicates, are automatically brave, good, wise, etc., while *cives* usually are good but can also be wicked or debased. *Homines*, on the other hand, can be characterized as good or evil but are often not overtly described as either. All of this is in keeping with the earlier statement that *homo* is the unmarked word for an adult male, while *vir* is a decidedly marked locution.

What is not purely an everyday feature of the Latin language, although it builds on the language's resources, is the extent to which Cicero exploits the approbatory connotation inherent in *vir* in attempting to exonerate his client. We have already seen that *vir* does not necessarily mean 'a brave, strong man';

Table III. Positive and Negative Adjectival Modification

ADJECTIVE	<i>vir</i>	<i>homo</i>	<i>civis</i>
<i>fortissimus</i> 'most brave'	15	0	3
<i>fortis</i> 'brave'	5	0	1
<i>optimus</i> 'best'	3	0	2
<i>bonus</i> 'good'	3	0	1
<i>summus</i> 'highest'	2	0	0
<i>clarissimus</i> 'most noteworthy'	2	0	0
<i>clarus</i> 'noteworthy'	0	1	0
<i>sapientissimus</i> 'most wise'	0	1	0
<i>sapiens</i> 'wise'	1	1	0
other positive adjectives	4	2	4
total positive adjectives	35	5	11
<i>sceleratissimus</i> 'most wicked'	0	1	0
<i>sceleratus</i> 'wicked'	0	0	2
<i>perditissimus</i> 'most debased'	0	0	2
<i>perditus</i> 'debased'	0	1	0
other negative adjectives	0	5	1
total negative adjectives	0	7	5

it may mean simply a husband, or a man to whose maleness the writer wishes to call attention. In fact, in his one of his letters to Atticus (I.13), written in 61 BC, Cicero refers to Clodius himself as a *vir*. The circumstance which provoked this characterization involved Clodius' being caught dressed as a woman at a religious ceremony from which all men were barred. Although Cicero and Clodius were not yet enemies at the time of the incident--indeed, the incident's aftermath was the first serious cause of their enmity--it is nevertheless clear that there is nothing of approbation in Cicero's reference to a *muliebri vestitu virum*, 'a man in woman's clothing'. He is referring to Clodius' maleness, nothing else; Cicero had great respect for the sanctity of Roman religious rituals.

Yet in the *Pro Milone*, *vir* is never used to mean 'male', in reference to Clodius or in reference to anyone else. Moreover, it is used with extreme frequency, particularly in comparison with its rarity in Cicero's own *Letters to*

Atticus. By avoiding use of *vir* in the sense of 'male' or 'husband', Cicero gave greater prominence to the word's already predominant meaning, namely 'brave, noble man'. Then, by using the word with this sense repeatedly throughout the speech, in reference both to his client and to other men, Cicero hoped to subtly but powerfully influence his hearers to believe that Milo was a *vir* in the only sense worth considering, and that such a virtuous man would never commit an evil deed.

What, then, of Clodius? He was certainly no *vir* and was a *civis* only in name. He was, in fact, a mere *homo*, and a wicked one at that. Lest there be any doubt that Cicero deliberately contrasted Milo as *vir* with Clodius as *homo*, consider the following clauses from his oration.

(25) ...vidit homo ad omne facinus paratissimus fortissimum virum...

'...the man prepared for any crime saw that boldest of men...'

(89) ...homo effeminatus fortissimum virum conaretur occidere...

'...an effeminate man tried to kill a most bold man...'

Of course, in both clauses, Clodius is the *homo* in question, while Milo is the *vir*. Such deliberate and rhetorically effective contrast within the same clause is clearly no accident. Cicero's use of *homo* and *vir* was a carefully applied device used to support his claim that Milo, the good, had done Rome a great service when, purely in self-defense, he slew the evil Clodius.

Epilogue

We owe most of our knowledge of the facts of this case to the exceptionally reliable commentary on the *Pro Milone* written by Quintus Asconius Pedianus in the 1st century A.D. Asconius was an impartial scholar whose main interest was in the speech as a speech; hence, he had no reason to distort the facts of the case when summarizing them. It is Asconius who makes plain that Milo was obviously guilty, and who further informs us that the speech in our possession today was not the one that Cicero actually delivered. Pro-Clodian mobs had packed the court on the day of the trial, and despite the presence of soldiers charged with keeping order, the crowd intimidated the orator sufficiently that he delivered his defense rather poorly. Perhaps partly because of this failure, but probably mostly because an honest jury saw the truth, Milo was convicted and went into voluntary exile, the accepted response to conviction for a capital crime. Cicero, chagrined by his failure to exonerate Milo, later wrote up the speech that he would have liked to have given and sent it to his erstwhile client. It is this version which we have today.

Despite the acceptance of exile as a substitute for execution, Clodius'

ghost did not have to wait too long for Milo's death. In 48 BC, Milo was killed during a civil war, as was Pompey later that same year. Last of all, Cicero was killed during another civil war in 43 BC. The bloody brawls between Clodians and Milonians had been only precursors of the infinitely more bloody conflicts which would claim the lives of most of their instigators and eventually put an end to the republic.

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IDEOLOGY AND PATTERNS IN TRANSLATION ERROR

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1. INTRODUCTION

1.1 Defining translation

Translation involves the production of a text in one language that was inspired by an existing text in another language, such that the two texts are in some sense "the same". Exactly how this is accomplished is open to question. In Sullivan 1984 I show the relationship between proper translation and paraphrase. Paraphrase is pictured in figure 1. It involves decoding the message from an existing text and re-encoding the message in a new text. This results in two texts different in form with the same message. Translation parallels this, except that the source and target texts are in different languages. Translation is pictured in figure 2.

Figure 1

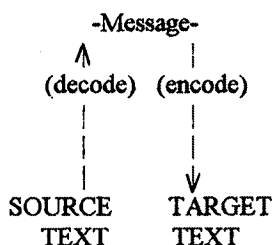
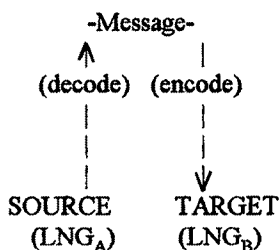


Figure 2



1.2 The quality of translation

Paraphrases vary in quality as a function of their accuracy, i.e. the degree to which the message they convey, when decoded, matches the message of the original text. This is true, whether they are translations or not. Since translations are often performed in formal and public circumstances the question of accuracy is raised with a greater percentage of translations than with monolingual paraphrases. But accuracy is important in all cases, and a complaint on accuracy should be taken seriously.

Literary translations adhere to a higher standard of quality, a standard that considers the form of the text as well as the message transmitted. The target text in a good translation is adjusted in form so that it corresponds to the source text. That is, the translation of a sonnet should be a sonnet, and the translation of a joke should be funny. Thus a translation may be criticized on both form and semantic content.

1.3 Errors in translation

Errors in translation are encodings which distort the message evoked by the source text. I distinguish between major and minor errors. The difference is easy to describe. Minor errors permit misunderstanding via imprecise encodings. Consider, for example, the Latin greeting common to early Christians: *pax vobiscum* 'peace (be) with you'. The customary reply *et cum spiritu tuo* 'and with thy spirit' is now rendered 'and also with you.' When I objected that this is inaccurate, I was told that it is "what *et cum spiritu tuo* actually means." That is, it is a personal reply, returning the good wishes to the greeter. Of course it is, but it was more in the original. The Latin text makes it clear that this exchange is a personal and spiritual one between co-religionists. It has to do with inner peace. It is not concerned with world peace or peace and quiet but with the peace of the soul. *And also with you* does not block the interpretation I suggest, but it also permits the alternatives mentioned. So the approved "translation" unnecessarily introduces ambiguities, which in turn permit misunderstanding.

Conversely, major errors introduce and require misunderstanding. In the course of this study I concentrate on the major errors in the English translation of the *Novus Ordo Missae* of the Roman Catholic Church. Exactly how major errors require misunderstanding becomes clear as we proceed.

1.4 Patterns in translation error

I am interested in two sides of translation error: the locus of the error and the effect of the error on the message. Consider first the locus of the error. I assume that the distribution of errors may be significant. That is, if the translator is incompetent in the grammar of the language, this will appear in syntactic and morphological errors. Incompetence in discourse structure will appear in errors in pronoun or other deictic reference, verb sequencing or tense, arrangement of subordinacy, etc. Insufficient familiarity with the subject matter results in inapt or arbitrary vocabulary choices from dictionary entries.¹ General incompetence should appear as mistakes randomly scattered throughout linguistic structure. Morphology, syntax, discourse structure, and the lexicon all participate. In short, the distribution of error loci will give some indication about the translators' competence.

The distribution of the effect of errors, on the other hand, may tell about the translators' intent. That is, the occurrence of ideologically random effects would be a sign of honest mistakes. However, if the effect of errors is patterned, it suggests an unconscious bias or even a conscious ideological predisposition on the part of the translators.

1.5 Background to the present study

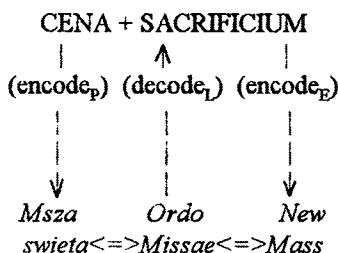
In 1971 the new Roman Catholic Mass commonly called the Paul VI Mass was introduced.² Controversial from the beginning in some quarters, not all of them conservative, the Paul VI Mass was made obligatory and the older Pius V Mass was banned. In the United States the bans went further: only the English translation of the Paul VI Mass was permitted in most dioceses; the Latin original was banned.³

One of the reasons for controversies surrounding the English translation of the *Missa Pauli Sexti* concerns the quality of the translation. An Irish priest told me that the

bishops of Ireland and the United Kingdom were unhappy with the English text produced by the American Bishops' Committee on the Liturgy and had refused to accept it for several years.⁴ There was a claim that the English text had numerous errors.

Both texts of the new Mass are translations from the authorized Latin text, as in figure 3, and should presumably be equivalent or nearly so. However, in 1979 I attended Mass in Poland and was struck by major discrepancies between the Polish and English texts. The discrepancies I noted were so great that I considered the English and Polish texts substantively different. At least one of them, in my opinion, must contain translation errors.

Figure 3



But this was merely my conclusion. The proper approach to verifying (or invalidating) this conclusion is to obtain a copy of the authoritative Latin text and compare the three. This was not easy to do, as no publication of the *Missa Pauli Sexti* has been authorized for the laity in the United States. Recently I found a priest (it is perhaps politic to leave him unnamed) who was willing to let me copy his Latin text. Using this text I was able to compare the two translations, concentrating on major errors only. The findings are both shocking and disappointing: the Polish text has no major errors that I could find; I estimate that the English text has at least 300.

I turn now to a description, classification, and analysis of these errors.

2. THE DATA

2.1 Materials and methods

Taking the Latin text of the *Missa Pauli Sexti* as the source text I compared the approved Polish and English translations to the original. About 30% of the total text was available to me in Polish, so the detailed comparison was limited to that portion of the text. The text comprises most of a single complete Ordinary (the fixed prayers), including one of the four Canons and the default Preface for Sunday. No Propers (Bible readings "proper to" a given day) were included, and some prayers recited privately by the priest were also omitted from the Polish text I have.

Minor errors were ignored. Major errors were classified according to linguistic type and semantic effect. No major errors were discovered in the Polish translation. For

the sake of brevity, therefore, I henceforth ignore the Polish text and concentrate on the major errors in the English translation.

2.2 Summary of error types

There are three major types of error in the English translation. First, something in the source text may be omitted. Second, something not in the source text may be added to the target text. Third, there may be a mistranslation of one sort or another, a point to which I return below. Finally, there are errors which combine any two or even all three of the above.

There are several types of mistranslation. They may be purely lexical, e.g. translating *magoi* as 'astrologers' (Sullivan 1984:371-73). But there are many possible grammatical errors. Each level of structure may have errors. Thus we may observe morphological, syntactic, and semological or discourse block errors. Among the morphological errors are confusing singular and plural in both nouns and verbs and confusing count nouns with collectives. The syntactic errors include rearranging word or phrase order, confusing subject and object, substituting a finite predicate for a participial or infinitival phrase, and confusing active and passive. The discourse errors involve rearranging sentences or phrases.

I now give some examples of each type.

2.3 Omissions

The simplest type of error is the omission of something in the original text. This may be as little as a single word or as much as an entire phrase. The phrase *totiusque ecclesiae suae sanctae* 'and all His holy Church' was translated without the word *holy*. What makes this a major error is that it removes the adjective that identifies the *ecclesia* in this prayer with the *unam, sanctam, catholicam et apostolicam ecclesiam* in the Nicene Creed and distinguishes it from any other church. That is, it blurs a significant distinction, whether between Catholic and Protestant or between Christian and non-Christian I cannot say. I do not know the intent of the translators for sure. But a significant distinction is blurred, and this is a major error.

There are also instances of omission of an entire phrase. The phrase *mea culpa, mea culpa, mea maxima culpa* 'my fault, my fault, my very great fault' is dropped entirely from the confession of sins (*Confiteor*). What makes this significant is the fact that it is the phrase which clearly identifies the responsibility for the sins. Without it, the confession of sins becomes a fairly general condemnation of sin.

The text studied contains many omissions. It is difficult to assess exactly how many there are. Some omissions are single words, some are as long as a clause. Considering semantic effect gives another side to the picture. Some omissions are clearly major errors, and I count 39 of these. Some appear to be minor. The status of some could be debated. But they all have one thing in common: each one could have been avoided.

2.4 Additions

Additions to the text are somewhat less common than omissions. They are exactly what they sound like. Something is put in the target text that is not in the source text.

For example, item *Tibi gratias agens* 'again giving You thanks' is translated 'again he gave you thanks and praise'. Ignore, for present purposes, the syntactic or discourse block error involved in changing a participial phrase into a finite clause. That is a distinct error. Focus instead on the addition of *and praise*, which is not in the Latin original. I do not pretend to theological expertise, so my comments here should not be taken as definitive. Yet I see this as a major error.

This text is from the Consecration, but it summarizes the Gospel texts on the Last Supper. The unnamed agent of *agens* is Jesus and *Tibi* refers to God the Father. In Catholic tradition, humans praise God in general and each Person of the Trinity separately. At the Last Supper, as Jesus performed the original Consecration of Bread and Wine, He was acting as God. Putting the praise of God into His mouth at this point either has Him praising Himself, which he eschewed more than once, or makes Him less God-like and more man-like. Again, as with the omission of *holy* discussed in section 2.3, a significant distinction is blurred. Here it is the distinction between Divine and human. Worse, the distinction is blurred with regard to Jesus Christ, "true God and true man," Who is the Incarnation of this distinction. This is a major error.

Now my analysis of this error could be disputed. What cannot be disputed is the nature of additions to the text. It could be argued that omissions might result from inadvertent carelessness. No such argument could be made about additions. They must be deliberate. The motivation behind them could be debated, a point to which I return below, but they can not be accidental. To the extent that they can be shown to be major errors, then, additions and their semantic effects are important. I count 8 of them.

Another important, if sometimes subtler, form of error is found in linguistically-based mistranslations, to which I now turn.

2.5 Mistranslations

Mistranslations may be lexical, morphological, syntactic, or sememic (discourse structure) in nature. There are plenty of lexical errors in the translation of the Paul VI Mass. Return to the *Orate fratres* 'Pray, brethren' and remember that this is being said by the priest to the congregation. The first phrase following the opening invocation is *ut meum ac vestrum sacrificium* 'that my sacrifice and yours'. This is translated 'that our sacrifice'. It is argued that mine + yours = ours. They may be equivalent, but only if *my* sacrifice and *your* sacrifice are the same sacrifice, i.e. that there is only one sacrifice involved. The original prayer has the priest and congregation making different sacrifices. The translation conflates them, blurring the distinction between priest and laity. I count 19 major lexical mistranslations.

Now consider structural errors. There are several morphological errors involving the singular-plural distinction. They are found with both nouns and verbs. For example, consider a formula that occurs several times during the Mass: *qui tollit peccata mundi* 'who takes away the sins of the world' is rendered 'you take away the sin of the world'. Again the shift from subordinate to independent clause is ignored. The error I focus on here involves the replacement of *sins* by *sin*. The Latin *peccata* is clearly a neuter accusative plural: *sins* is correct. By using the singular *sin* the approved translation gives the text a collective reading, as if it should be understood 'take away the sinful-

ness of the world'. What makes this important is that it downgrades individual responsibility for individual acts. This parallels the effect of removing *mea culpa* from the *Confiteor* (see section 2.3). Moreover, the first occurrence of erroneous *sin* is in the *Gloria*, which immediately follows the *Confiteor*. The juxtaposition is striking.

The opposite (rendering singular as plural) occurs throughout the *Credo* or Creed. *Credo in Unum Deum* 'I believe in One God' is translated as We believe in One God'. The two other first-person singular verbs in the *Credo* (*confiteor* 'I confess' and *expecto* 'I await') are translated with *we* wherever they occur. This is a particularly insidious error. Since the Creed is recited in unison by the entire congregation, the use of *we* is not generally striking. But remember that the Creed is a profession of faith, of beliefs. Religious beliefs are held by individuals. They are not a product of the democratic process, as in *we elected Bill president*. Again individual responsibility is shifted to the communal sense.

In the interest of brevity I give no examples of error in text structure. Those interested may look at the radical and extensive reordering of clauses in the *Gloria* and draw their own conclusions.

A beautiful example of combined errors is found in the translation of *qui pro vobis et pro multis effundetur* 'which for you and for many will be shed'. This phrase is part of the consecration prayer. It is translated 'It will be shed for you and for all men'. Note the shift from subordinate to main clause (syntactic), the translation of *multis* as 'all' instead of 'many' (lexical), and the addition of *men* to the text.⁵

The error in adding *men* is obvious, and there is no need to analyze it. But the shift of *multis* from 'many' to 'all' deserves discussion. This error has been justified by appeal to a putative tradition of the early Church that salvation is given to everyone. Ignore the fact that *salvation is offered for everyone* (the actual tradition, in my reading of the *Acts*) differs from *salvation is given to everyone*, which is another blurred distinction. Note instead that there are at least three Latin expressions which could have been used in this ancient prayer and which would have made more sense to translate using 'all': *pro omnibus* 'for all', *pro multitudine* 'for the multitude', and *pro his multis* 'for the many'. But none of those occur. *Pro multis* is a much weaker expression than any of the other three. In their absence, translating *pro multis* as 'for all' is hardly justifiable. A dominant early Christian tradition of universal salvation would surely have introduced one of the stronger expressions.

I count 38 major errors at all levels of structure. I now summarize my findings.

3. THE RESULTS

3.1 Error types

All the error types discussed are found in the English translation of the *Missa Pauli Sexti*. There are 39 omissions, 8 additions, 19 lexical mistranslations, and 38 grammatical errors that I classify as major. This is a total of 103 major errors. When faced with a "combination" error I counted it as an error in each of the relevant categories. This may have inflated the count somewhat. But there is an offset. I don't know how

to classify the introduction to the Lord's Prayer. There are four versions in the English text, none of which bears much resemblance to the Latin original. As a result, I cannot count these errors. Thus 103 major errors in 30% of the text is a realistic estimate.

Assuming that the remaining 70% of the text has errors at the same rate, the entire English translation may have over 340 major errors.

3.2 Summary of error types

Omissions constitute the largest category (39), but the grammatical category (38) is of the same order of magnitude. It could be argued that I should distinguish between different types of structural errors and divide the grammatical category, taking the stratification of language into account. For current purposes, I simply group them together, using the most conservative numerical estimate. In sum, the grammatical errors and omissions are essentially equal. Each of these is roughly twice the size of the 19 lexical mistranslations, which is a little more than twice the size of the 8 additions. This gives roughly a 4::4::2::1 ratio for the four categories.

Ratios aside, it is clear that the types of mistranslations are spread over all existing categories. It now remains to see what the distribution of error effects is.

3.3 Error effects

The errors found all have clear effects. I group them into two general categories: the reduction of personal responsibility and the blurring of important distinctions. I consider these categories in turn, using the examples given above.

The omission of *mea culpa* (cf. section 2.3) eliminates an acceptance of individual responsibility for sins in a prayer that is supposed to be a personal confession of sins, the *Confiteor* (= I confess). The translation of *peccata* 'sins' as a singular (cf. section 2.5), which occurs in the *Gloria*, immediately after the *Confiteor*, and at five other places in the Mass, reduces individual sins to some kind of general sinfulness. Translation of *credo* 'I believe' as 'we believe' substitutes community consensus for a personal profession of faith. All three reduce or eliminate individual responsibility by either distracting attention from the presumably responsible individual or by reducing the seriousness of the acts for which the individual is responsible.

The other errors show a different effect, the blurring of distinctions. Adding *and praise* to the consecration (cf. section 2.4) reduces the God-like character of Jesus and blurs the distinction between Divine and Human. Translating *pro multis* 'for many' as 'for all' blurs the distinction between the *many*, who accept Jesus as the Messiah and Savior and the *all*, which includes those who actively reject Him. Translating *ut meum ac vestrum sacrificium* 'that my sacrifice and yours' as 'our sacrifice' blurs the distinction between priest and laity.

Examples with these two types of effects occur everywhere in the English text. Each effect occurs with every error type, and every error noted has one or the other effect. In at least one case⁶ a phrase is translated so as to combine both types of effect.

3.4 Summary of error effects

The 103 errors are evenly divided between the two general effects: reducing individual responsibility and blurring distinctions. The distinctions blurred may be between Divine and human, between Catholic and non-Catholic (or Christian and non-Christian), or between priest and laity. It could be argued in some cases that what is blurred is the distinction between religion and its absence. Yet these are all important distinctions. I group them together because they are the questions whose answers constitute the stuff of religion, in this case Catholicism.

4. ANALYSIS

4.1 Error patterns

The error types are universally distributed through all possible types. This shows that the errors are not due to the translators' incompetence in some part of Latin structure or vocabulary (or, for that matter, in some part of English). It does not rule out general and universal incompetence for all the translators,⁷ but this is an unlikely scenario. Moreover, there are too many errors to be ascribed to mere carelessness without further evidence. In fact, there is evidence against concluding either general incompetence or massive carelessness.

Incompetence or carelessness could produce the distribution of error types seen in the text. However, the error effects should also be random, and they are not. They fall into two categories. Such a clustering suggests that there is an ideological motivation behind the mistranslations. An examination of the error effects will demonstrate that they complement each other and will expose that ideology.

4.2 Semantic patterns and Ideology

Reducing individual responsibility and blurring distinctions do not appear to be aimed in the same direction, at least at first glance, but they are. Consider the reduction of personal responsibility. It is aimed directly at the faithful, the ordinary church members. It tells us that we have less to worry about, in the area of fulfilling personal obligations. This is sometimes justified in terms of non-judgementalism or the like. Certainly reduced responsibility is one way of reducing the guilt that often comes with (inevitable) failures.

In traditional Christianity outside the most rigid Calvinist lines, however, and in Catholicism in particular, there is a different mode of reducing guilt: the individual accepts responsibility for sins and depends on God's mercy, receiving absolution in return in the sacrament of Penance (now renamed Reconciliation⁸). Reducing individual responsibility reduces or even eliminates the need for absolution. One of Luther's dogmatic disagreements with Rome was over the definition of sacraments, and Penance is one of the sacraments he defined out of existence. Hence the reduction of individual responsibility in the English translation of the *Missa Pauli Sexti* also blurs the distinction between Catholic and non-Catholic.

The two error effects are also complementary. As shown above, the reduction of individual responsibility is aimed at the Catholic faithful. The blurring of distinctions is aimed at the institutional Church by undermining her theology. So together the error effects of the English translation of the *Missa Pauli Sexti* aim at both parts of the temporal Catholic Church. A concerted attack of this sort, it may be assumed, is not accidental. Instead, it is driven by an underlying ideology. I now turn to the character and identity of this ideology.

4.3 The ideology

Both error effects are examples of moral relativism, which characterizes Modernism. Modernism was condemned as error over a century ago by Pope Pius X in his encyclical *Pascendi*.⁹ It infected much of liberal Christianity (i.e. mainstream Protestantism) during the late 19th and early 20th centuries, and it is my impression that the Fundamentalist movement was to at least some extent a Protestant reaction to Modernism. Over the years some Catholic theologians also adopted Modernism in error. In the period before WWII, some of them were stripped of the title "theologian," and their writings were removed from the official Catholic publications lists. But the Modernist influence was strong in some countries, e.g. France and the USA, and it blossomed in the post-Vatican II era, producing the translations we have today.

The only problem with this analysis is that it puts the blame on Catholic priests and bishops--the very people entrusted with protecting the Faith. On its face, then, it seems unlikely. Yet there are two distinct kinds of evidence which show that the analysis is accurate. I turn to them now.

4.4 External evidence for Catholic Modernism

There are two independent sources of evidence of Catholic Modernism in the United States. First, consider the contemporary liturgical practices which are complete breaks with Catholic tradition and which were not mandated by Vatican II but which are almost universally enforced (not merely permitted) in the USA today. They include replacing the altar with a Communion table, requiring that the priest face the congregation, substituting "seasonal" texts or congregational hymns for the Bible texts proper to a given day, dropping the *Confiteor* and the *Gloria*, banning the Mass of the Catechumens, etc. At least some priests also refuse to wear liturgical colors. What remains of the Mass is almost identical to a Presbyterian Communion Service.

Still, it could be maintained that these practices are merely coincidental. What is not coincidental is the preface to Batistini (1985, paragraph 1): "The two previous editions, 1971 and 1975, ... attempted to *move American Catholics more toward the mainstream of Christian hymnody* (my emphasis). The present edition reflects our perception of that growth." This is a document approved by the National Council of (American) Catholic Bishops and their Committee on the Liturgy.

Q. E. D.

5. SUMMARY

5.1 Conclusions

The English translation of the *Missa Pauli Sexti* has hundreds of major errors.

The errors are of all types: omissions and additions, lexical and structural mistranslations.

The effects of the errors distort the text to reduce individual responsibility on the part of the faithful and to blur distinctions which are important in traditional Catholic doctrine.

These effects are complementary attacks on traditional Catholicism (and even Christianity, in general).

Both effects reflect the moral relativism which is a mark of Modernism.

The mistranslations were introduced into the post-Vatican II American Catholic Church by influential members of the priesthood and approved by bishops who were infected by Modernism.

The Modernist clergy's intent is to subvert traditional Catholicism and remake it in the image of liberal mainstream Protestantism.

5.2 Afterword

Lest it seem I am too hard on liberal Protestantism here, I wish to state that I have no such intent. If anyone, including a Catholic priest or bishop, feels that some branch of liberal Protestantism is right and Catholicism is wrong wherever they disagree, that is fine by me. They should have the courage of their convictions and become practicing members of that religion. My sincere best wishes go with them. Failing that, they could bring their ideas out in the open and attempt to convince other Catholics, openly and honestly, that Modernism is correct and Pius X was wrong.

However, I see no excuse for Modernist Catholics trying to subvert Catholicism to their image of a church. They refuse to debate these questions openly. This is perhaps because they know that the opposition to their intentions would be massive, coming from both clergy and educated laity, and from orthodox liberal Catholics as well as traditionalists. Instead they attempt to achieve their goals by bringing in an erroneous translation of the Mass and relying on the old maxim: *lex orandi, lex credendi* 'the law of praying is the law of believing', or, in more colloquial phrasing: as we pray, so we believe. Believe me, this is not what the Second Vatican Council ordered.

NOTES

¹I speak from sad experience as a student and teacher of language.

²Contrary to popular opinion and to the claims of certain Catholic Bishops, this Mass was not mandated either directly by the Second Vatican Council or indirectly in any of the documents promulgated by it.

³More precisely the public celebration of Mass in Latin was banned; bishops do not have the authority to ban any approved Mass unilaterally.

⁴The text is often clumsy English (my judgement) and it was claimed by some that this was the reason for the Europeans' intransigence.

⁵One of the more egregious examples of lexical sexism in the English translation, *men* has recently been dropped from the text. Still, it clearly illustrates sexism which was not present in the *Missa Pauli Sexti* but which was added in the translation.

⁶*Nobis quoque peccatoribus, famulis tuis* 'For us as well, sinners, (yet) thy servants' is translated without a reference to *servants*. Moreover, the reference to *sinners* is changed to a reference to *sin* and moved to the end of the prayer.

⁷I have it on good authority that at least one member is incompetent in Latin, but I do not know what his responsibilities were, so his incompetence might not be relevant.

⁸My personal opinion is that the renaming is part of the same syndrome, but I invite readers to draw their own conclusions.

⁹The intellectual roots of Modernism can be traced back at least to Nestorianism, which was declared an error at the Council of Ephesus in AD 431.

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GRAMMATICAL FORM VERSUS INFORMATION FLOW IN TRANSLATION

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When translating between two typologically diverse languages, one sometimes has to make a choice between grammatical form and information flow. Transfer from a head-initial (VO) language into a head-final (OV) language, for example, often involves a radically different syntactic order of a given grammatical form, compared to the case of transfer from one SVO language into another.

This paper explores some considerations and guidelines regarding such choices in translating an English text into Korean. While English--a (weakly) head-initial language--allows both pre- and post-modifiers to the head noun in a noun phrase, Korean--a (strongly) head-final language--does not. All modifiers have to be preposed to the head noun in Korean, and postposed dependent clauses are not allowed, except in conversation. Yet, it has been found that there are some functional differences between pre- and postposed elements in English. How then can we capture such functional differences in English and represent them in a Korean translation?

In many cases we may use an analogous grammatical form in translation, e.g., an English relative clause (which is postnominal) as a Korean relative clause (prenominal), both of which function primarily to report descriptive background information regarding a participant or topic. There are clear instances, however, where the conflict of information flow is such that the translator must resort to another grammatical form. This tension between grammatical form and information flow is discussed in this paper, with English and Korean data as seen in their discourse contexts. Previous studies of my own have pointed out such contrastive features in written narrative texts in Korean and English (Hwang 1990a and 1990b).

For the present paper, in order to see if there are differences across genres, most of the examples are drawn from Pike's *Linguistic Concepts* (1982), an expository text, with some examples from narrative texts.¹ The paper starts with some background discussion on language typology and its relevance to translation. Sections 2-5 discuss specific grammatical constructions, such as the noun phrase, relative clause, adverbial clause, and passive, with suggestions for the choice between grammatical form and natural information flow. The paper concludes with mention of some areas for further research.

1. Language Typology and Translation

Several studies on linguistic universals and typology have pointed out that certain implicational universals may be derived from the basic word (constituent) order of a language. If a language has, for example, a dominant VSO order, it is predicted to have prepositions and the adjective occurring after the noun. Although there is a danger in pushing such correlations too far (cf. a warning by Comrie 1989:99-102), these insights may be helpful, especially at the beginning stage of the fieldwork. The grammatical features that present a mirror image between OV and VO languages can be overwhelming; it is, in fact, the case between Korean and English. In order to highlight the radical difference in ordering of information in typologically diverse languages, I present here the implicational universal parameters for two broad groups of language, head-final and head-initial.

	Head-Final OV (SOV)	Head-Initial VO (VSO, SVO)
Adposition:	Postposition	Preposition
Noun Phrase Modifier:	Modifier-Noun	Noun-Modifier
	(Adjective, Genitive, Relative Clause, Determiner, Numeral)	
Adverb & Adjective:	Adv-Adj	Adj-Adv
Main Verb & Auxiliary:	Main-Aux	Aux-Main
Affixation:	Suffixation	Prefixation (and Suffixation)
Direct Obj & Indirect Obj:	IO-DO	DO-IO
Adverb & Verb:	Adv-Verb	Verb-Adv
Numeral:	Decimal-Unit	Unit-Decimal
Question & Negation:	Proposition-Neg-Q	Q-Neg-Proposition
Complementation:	Complement-Verb	Verb-Complement
Comparison:	Standard-Relator	Relator-Standard
Title:	Name-Title	Title-Name
Name:	Family-Given	Given-Family
Phrase Direction:	Macro-Micro	Micro-Macro
Conjunction:	Clause-Conj, . . .	Conj-Clause, . . .
Adverbial Clauses:	Preposed	Postposed (and Preposed)
If Clause Chaining:	Medial-Final Clause	Initial-Medial Clause
Fully Inflected Verb:	Final Verb	Initial Verb
If Switch Reference:	Clause-SR marker	SR marker-Clause

Most literature dealing with these parameters is primarily concerned with the adposition, and the order of the genitive or adjective or relative clause and the noun. Others deal with the parameters up to the title and name in the list. I have added the rest from my research.

Phrase direction indicates the ordering of elements within a phrase such as locative, temporal, and possessive, e.g., Dallas, Texas, U.S.A. (a micro-to-macro

order) versus U.S.A., Texas, Dallas (a macro-to-micro order, as in Korean). The position of the conjunction linking two clauses in a sentence is opposite in the two types of language, e.g., conjunctions are usually suffixed to the clause-final verb in head-final languages. Adverbial clauses in strongly head-final languages are preposed only, except in conversational data.² The last three parameters apply only for clause-chaining languages, and the final one only for those with a switch-reference system.

The list is simplified and overgeneralized; perhaps someone might argue that no one language would conform to all of the parameters. English, for example, is largely head-initial, but has some head-final characteristics such as the Determiner-Noun, Adjective-Noun or Genitive('s)-Noun order. This is not uncommon especially for SVO languages, which are more weakly head-initial than VSO ones. On the other hand, Korean follows nearly all the predictions made for head-final languages. The only exception might be the fact that a numeral with the classifier may sometimes follow the head noun.

When translating between languages which have a mirror-image syntactic ordering, do we just translate the sentence backward word-by-word? Of course not, even though in some cases the resulting sentences may be grammatical. Translation of a text is more than producing grammatical sentences in the target language. There is a progression of information flow at different constituent levels that is sensitive to the enhancement of understanding of the text. For example, as Fries (1983) shows, each sentence or paragraph has an appropriate point of departure to guide the reader. In (1) below, the initial prepositional phrases identify the topics that are being compared:

- (1) a. *In the inductive approach, some available data may be carefully classified as elements . . .* (2 more sentences)
- b. *In a deductive, formal approach, one guesses, to reach an idea of a larger pattern . . .* (3 more sentences) (Pike 8-9)

The initial phrases of each paragraph provide the topic for the following sentences. They need to be initial in the sentence in Korean as well in order to give a proper orientation to the reader.

The following English sentence and my translation of it into Korean³ illustrate the opposite syntactic order (complement clauses are in parentheses):

- (2) *One approach to studying language emphasizes (that man as a user of language affects the nature of the units of his language).* (Pike 3)

ønø yønku-uy han jøpkønþøp-esø-nun (inkan-i ønø sayongja-losø
lg. study-Poss one approach-in-Top man-Nom lg. user-as

ønø tanwi ponjil-e yønghyang-ul mijhinta-nun) køs-ul kangjohanta.
lg. unit nature-at influence-Acc affect-prM fact-Acc emphasize

The English subject, *one approach to studying language*, becomes a postpositional phrase (In one approach to studying language) as topic in Korean, leaving the grammatical subject implicit, as an understood subject like 'a researcher'. *Man as a user of language*, the embedded subject, looks similar in Korean (man-Nom language user-as), but even here the Nominative marker is attached to man, leaving the phrase as a language user outside the NP, unlike the case of English. The embedded English object NP *the nature of the units of his language* is easily translated by reversing the word order to a (noun) modifier-head construction: language unit nature. A similar opposite order is found in other phrases: *one approach to studying language* vs language study's one approach and *as a user of language* vs language user-as. However, the overall flow of information at the higher constituent level of the sentence is similar for the two languages, except that the main clause verb emphasize comes at the end of the sentence in the verb-final language Korean.

The sentence in (3), which immediately follows (2) in the original text, illustrates the need for a more radical adaptation in translation (Pike 3):

- (3) *His reactions to language become part of the data for the study of language, because described expectations of his reactions are part of the definitions of the structure of language.*

ønø-etä.ha-n inkan.jasin-uy panung-i ønø.yønku-lul wiha-n
lg.-about-prM man self-Poss reaction-Nom lg. study-Acc be.for-prM

jalyo-uy ilpu-ka twenta.
data-Poss part-Nom become

kä køs-un (jasin-i øttøkhe panung.halji ha-nun) kitä-ka
the thing-Top self-Nom how will.react do-prM expectation-Nom

ønø.kujo jønguy-uy ilpu i-ki.ttämun ita.
lg. structure definition-Poss part be-because be

As in (2), the elements in long NPs are in reverse order: *part of the data for the study of language* vs language study-for data's part and *part of the definitions of the structure of language* vs language structure definition's part.⁴ But what is more striking in the translation of (3) is that the sentence is now split into two independent sentences in Korean. The second sentence is an equational sentence stating the reason for the first one: That is because expectations as to how he himself will react are part of the definitions of the structure of language. Since Korean does not allow postposed adverbial clauses and the clause is quite long, they are now split into two independent sentences⁵ in order to keep the information flow of the original. This is an example of the adjustment of

grammatical form (from an adverbial clause to a separate equational sentence) to keep the natural information flow.

2. Postmodifiers in the Noun Phrase

We have already seen in (2) and (3) that English NP postmodifiers become preposed in Korean. An English NP may have both pre- and postmodifiers, with determiners and adjectives before the head, and prepositional phrases and relative clauses after the head. Sometimes they may take on contrastive meanings depending on the position, as in *the big toe* vs *the toe which is big* (which may be temporarily swollen). Since only the premodifier position is available in the grammar of Korean, all types of modifiers must be stacked up preceding the head. For the different meanings regarding the toe, Korean has a specific lexical expression omji palkalak (a modifier-head construction) for *the big toe*, and other expressions for *the toe which is big* like phu-n palkalak 'big-prM toe' or khø-ji-n palkalak 'big-become-pM toe'. Thus, to convey these contrastive meanings, different lexical expressions are used in the premodifier position in Korean, whereas the same word *big* is used in different positions in English.

Since all modifiers come before a Korean noun, when there are several modifiers they need to be arranged in a certain order. The next example shows how an English NP with both pre- and postmodifiers is translated into a Korean NP: *long and short speeches of an individual* (Pike 14) vs han kǎin-uy kil-ko jjalpu-n onǎ 'one individual-Poss long-and short-prM speeches'. When there are several modifying clauses (especially all with modifying endings), a comma may be necessary to keep them separated into units.

3. Relative Clauses

Relative clauses (RCs) which are semantically restrictive and identifying are best translated as RCs in Korean also, even when the RC is long.

- (4) 1 "*Why study theory?* 2 *Why not just be practical?*" 3 *So speak those [who fail to realize (that the line between theory and practice is blurred)--(that in many situations only an approach to theory will allow practical results to be obtained in reaching one's goals)].* 4 *Today's practicality is often no more than the accepted form of yesterday's theory.* (Pike 5)

The information in the long RC (in brackets) in S3 with two complement clauses (in parentheses) should be translated as the first element in the sentence, followed by the head noun person and the verb phrase so speak. In this case, the close connection in English between the direct quotation and the quotation formula (*So speak those who . . .*) is interrupted by the long RC identifying the speaker in Korean. Likewise, information in most short RCs, whether restrictive or nonrestrictive in meaning, can be transferred using RCs in Korean. For example:

- (5) *Only if a theory is simpler than that reality [which it is in part reflecting] is it useful.* (Pike 6)

ilon-un [uli-ka khiphi sāngkak.ha-koja ha-nun] hyönsil-pota
theory-Top we-Nom deeply think-be.about.to do-prM reality-than

kantan.ha-l ttä-e-man yuyong.hata.
simple-fM time-at-only be.useful

However, there are several examples of English RCs whose information may not be transferred by means of an RC in Korean. The postnominal position of the English RC allows it to carry information sometimes temporally or logically sequential to that encoded in the main clause, as in *Slowly he walked along the aisle and up the steps to the choir, [where he handed the plate to the priest], [who blessed the gifts and then reverently placed them on the altar]*. The two relative clauses in the sentence clearly describe subsequent actions; thus, if we were to use RCs in Korean, the sequence of events will be reversed, making a nonsensical sentence.⁶ The order of information flow needs to be kept the same to make a coherent sentence in this case; instead of an RC, we need to use a sentence with a clause chain in Korean.⁷ For an example from expository discourse with logically subsequent information in the RC (e.g., reason-result, means-purpose, and condition-consequence), note the second RC in (6):

- (6) *The list and kind of things [men find] will vary radically if they adopt different theories as tools [with which to search for these units].* (Pike 3)

In the context of the sentence, *they first adopt different theories as tools* to search for the units. Examples of this kind of RC are translated as a clause chain, such as adopt different theories as tools and search for the units (means-purpose). Other examples of this type are: *The word **big** has several lexical meanings [which are not easy for the beginner to differentiate]* (Pike 49-50), and *The right-hand branch is marked as **marginal**, and **response**, manifested by **paragraph**, [in which tense and personal reference are controlled for cohesion]* (Pike 80).

4. Postposed Adverbial Clauses

In English an adverbial or participial clause (in braces below) may come before or after a main clause:

- (7) a. {*When you picked me up,*} you knew what I was.
b. You knew what I was {*when you picked me up*}.

Although the positional difference might seem like a free variation, we can see why one order is chosen in the context of discourse:

- (8) 1*There he laid it gently on the grass, {when suddenly the snake coiled, rattled and leapt, biting him on the leg}.*
 2*"But you promised . . ." cried the youth.*
 3*"You knew what I was {when you picked me up}," said the snake as it slithered away.*

The temporal clause in S3 encodes incidental, temporal information relating to the main clause only. If the other order were used in this context, the temporal clause would be interpreted as setting the stage, as if functioning at the higher level of paragraph. Compare it with (9) below, which has a preposed *when* clause.

- (9) *{When I caught sight of you from the window this afternoon,} I daren't open the door {because I thought you'd come for the rent}.*

The postposed *because* clause provides the reason for the main clause, within the overall setting established by the *when* clause.

This type of functional distribution of adverbial clauses is dealt with by Ramsay (1987, for *if* and *when* clauses), Givón (1987, 1989 & 1990), Thompson (1985, for purpose clauses), and Hwang (1990a). Generally noted is the fact that preposed clauses have an orienting (thematic and pragmatic) function linking larger constituents like sentences and even paragraphs, while postposed clauses have a more integrated function of providing more semantic information of a narrower scope within the sentence.

How can we reflect functional differences of this kind in Korean when there is no choice of the alternative position in the grammar of language? Unlike Givón (1989:333-34), who said that the meaning (or 'function') of the more-integrated postposed adverbial clauses cannot be conveyed in a strictly verb-final language, I propose that there are several devices that serve equivalent functions in Korean, as discussed below in 4.1-3.

4.1. The same grammatical form may be used with a slight alteration of information flow, as in the following translation of (7).

- (7) a. {na-lul jipøssul ttä} nø-nun nä-ka muøssinji alatta.
 I-Acc picked.up when you-Top I-Nom what.is knew
 '{When (you) picked me up,} you knew what I was.'
- b. nø-nun {na-lul jipøssul ttä} nä-ka muøssinji alatta.
 you-Top I-Acc picked.up when I-Nom what.is knew
 'You, {when (you) picked me up,} knew what I was.'

While (7a) corresponds to the English preposed clause, which may have a backreferencing function, the main clause subject in (7b) is in the sentence-initial position. This puts the adverbial clause inside the main clause, certainly creating

the more-integrated effect. Example (9) may be similarly translated in Korean as follows: {When I saw you from the window this afternoon,} I, {because (I) thought you'd come for the rent,} daren't open the door. An example of the expository type is in (10).

(10) *A theory must be simpler than reality {if it is to be helpful}.* (Pike 5)

ilon-un {toun-i twe-ki.wihäsø-nun} hyønsil-pota
theory-Top help-Nom become-in.order.to-Top reality-than

kantan.hä-ya.hanta.

be.simple-must

'A theory, {in order to be helpful,} must be simpler than reality.'

4.2. There are cases in which the grammatical form needs to be radically changed in order to maintain the information flow that is appropriate to the discourse context. One may even have to reverse the status of main versus adverbial clauses in certain cases, as in the first sentence of (8): *There he laid it gently on the grass, {when suddenly the snake coiled, rattled and leapt, biting him on the leg}.* vs {On the grass (he) put (it) gently-when, the snake suddenly coil-and, rattle-and, leap-and, bit his leg 'When (he) gently put (it) on the grass, the snake suddenly coiled, rattled, leapt, and bit him on the leg.' The surprise, dramatic effect created by encoding crucial eventline material in the postposed *when* clause in English is not completely lost in the Korean translation, since the suffixal conjunction *-l.ttä* 'when' occurs at the end of the first clause. In this example, the English sentence may not be translated into an equivalent grammatical form in Korean, since it will reverse the sequential order of the two events: *{When suddenly the snake coiled, rattled and leapt, biting him on the leg, he laid it gently on the grass.

In our expository text, there are some postposed dependent clauses, not headed by a subordinating conjunction, but grammatically reduced to a participial clauses with *-ing*, much like a chaining structure found in other languages. Look at the following sentences (Pike 38):

(11) *An observer may shift his attention from an item to its background, {thereby treating the background as a whole as itself a unit}. . . Or one can combine them, {by saying, "Note the beautiful changing pattern of lights of that city as a whole."}*

In both sentences, the information in the main clause is logically prior to that in the participial, making it awkward to translate these participial clauses into preposed clauses in Korean. Again, a clause chain is used in Korean for the two clauses in question. The auxiliary modal occurs at the end of the sentence after the verb of the second clause applying to both clauses, a feature typical of chaining structure: An observer from an item to its background his attention shift-and, background as

a whole as itself a unit treat-may. The second sentence is similarly translated as: Or three perspectives (we) combine-and, "That city as a whole's beautiful changing pattern (you) note," so (we) say-can.

4.3. An equational sentence with embedded clauses may be used to maintain the information flow.

- (12) *But what do we mean by similar? Units will appear to be similar only if they share some component within the same universe of discourse. Joey and Billy of Seattle can be compared easily, {since they share maleness, youth, and the same community}. (Pike 43)*

Compare the last sentence with the following Korean structure: That Joey and Billy of Seattle can be compared easily is because they share maleness, youth, and the same community. Notice, however, the force of the assertion is shifted from the weight on the main clause in the original to that on the *because* clause in Korean. I felt it was an acceptable shift of weight in the context, necessitated by the need to keep the information flow of the original. The comparison of Joey and Billy is an illustration for the similarity and shared characteristics.

More commonly, however, this type of weight shift between the main and subordinate clauses is not desirable. Therefore, the use of an equational sentence is confined to the second clause, with or without the overt subject like that.

- (13) *. . . deals with Browning's meeting of a man who met Shelley. The shock of this caused Browning to pale, {since even such an indirect contact with the great man Shelley was staggering}. (Pike 36)*

The shock of this caused Browning to pale, and that is because even such an indirect contact with the great man Shelley was staggering.

Next is an example of a *so that* purpose clause, which is translated into a clause chain. As in the case of (11), the auxiliary *must* comes at the end, applying to the whole sentence.

- (14) *. . . our particular commitments need to be made explicit for the reader {so that he can compare them with implicit or explicit commitments of other scholars}. (Pike 10)*

Our particular commitments explicitly (we) make-so, the reader with those of other scholars compare-can-cause-must.

In some cases, two clauses are made into two separate sentences, as shown in (3). An additional example of this kind has *for*, a coordinating reason conjunction rather than a subordinating conjunction like *because* or *since*: *Into the*

same river you could not step twice, for other [and still other] waters are flowing (Pike 52) vs *Into the same river twice (you) step-cannot. (That) is because other [and still other] water flowing-is.*

5. Passives

Passives are frequently used in English to avoid mentioning the agent, who is either obvious or irrelevant, and to maintain topic continuity in the sentence or paragraph (cf. Thompson 1987). They are especially common in the expository genre. In many cases these English passives must be converted into actives in Korean. There are a few syntactic reasons for this. In Korean sentences, there need be no overt subject or any other argument as long as they are deducible from context. So passives are not required to avoid mentioning the agent or for topic continuity. Also, the change of information flow from the active to the passive is achieved in Korean without resorting to the passive. That is, patient nouns may be preposed in the sentence as a topic with the topic marker without a passive verb, as in (15), from Pike (55).

- (15) *Free variation in the manifestation of the subject of a clause tagmeme can be seen in the replacement of one word by another . . . (2 more sentences)*
Conditioned variation can be seen in the predicate . . . (2 more sentences)

Free variation-Top . . . (we) can see.

Conditioned variation-Top . . . (we) can see.

In another example, *we are born to talk* (Pike 44), the corresponding verb in Korean thāona is not passive but active. Conversely, some active verbs in English with a patient noun as subject, e.g., *break*, as in *The dish broke*, would be rendered as passives in Korean, as The dish is broken. If the agent is understood as in (1) broke the dish, the sentence remains active. Passives are more appropriate with a nonspecific agent (which can be left out both in active and passive sentences in Korean).

- (16) *The paragraph B-D in turn breaks down into a nucleus and two margins . . .*
The complex sentence B is then broken into clauses Ba and Bb; and the
passive transitive clause root . . . is broken down into subject . . . For
lack of space, further breakdown is not given. (Pike 80)

In (16), the first verb *break down* is translated as the passive in Korean, along with the next two passive verbs; passives here contribute to the generality of the agent, implying that any serious linguist, not just the author, can do such parsing. The passive in the last sentence, however, is translated into the active, since the specific agent, the author, is understood. In general, many English passives are converted

into Korean actives since actives sound more natural while maintaining the natural information flow.

6. Conclusion

Translation is a holistic process. Rather than just translating a string of words, the translator needs to treat the sentence as a whole, as well as the paragraph, the chapter, and the text. The awareness of this holistic approach to translation includes attention to the appropriate information flow at different constituent levels of grammar. This attention sometimes overrides the transfer of the grammatical form used in the original text in favor of another form or construction that better maintains the flow of information in context.

This paper has dealt with translation of some grammatical forms, such as modifiers in the noun phrase (including relative clauses), adverbial clauses, and passives. Examples were given mainly from the expository genre with occasional illustrations from the narrative. There are preferred constructions frequently found in a given genre, e.g., passives in expository, conditional clauses in hortatory, and temporal adverbial clauses with a backreferencing function in narrative and procedural genres. The possible conflict between grammatical form versus information flow in translation apparently occurs regardless of genres, whether narrative or expository.

There are other interesting constructions in English that present similar conflicts in translation which need further research, such as verbs followed by a long list of items, or lengthy constituents that are often right dislocated in English (e.g., *a matrix is given showing certain of the subject suffixes of some Fore . . . verbs*, Pike 56). Korean prefers a left dislocation. The participial clause (*showing . . .*) would be placed before *a matrix* and thus modifying it.

Sentences with verbal nouns used as an argument in a clause are frequently transferred using a clause combination rather than a single clause: e.g., *Refusal to acknowledge identity within variability would stop all normal behavior* (Pike 53) is translated as Unless (we) acknowledge identity within variability, all normal behavior would stop.

Equally challenging is the area of lexical semantics: e.g., the word like *identity* is translated into different lexical items depending whether the word is used in the sense of a 'true form' or 'substance', or it is used in the context of the wave perspective as in *identity within change*.

Notes

1. All references to Pike in the examples are to this book. Prof. Hyon Sook Shin, a linguist in Korea, and I have translated the book into Korean, which will be published in Korea.
2. Purpose clauses in Guanano, a Tucanoan language of Colombia, South America, are an exception to this; they are postposed, perhaps to reflect the

iconically subsequent relationship of the information in the purpose to that of the main clause (Waltz 1976).

3. Italics are used for all English examples, and underlining for Korean translations except for those blocked with the Korean data. The abbreviations used here are: Acc=Accusative, f=future, lg.=language, M=Modifying ending, Nom=Nominative, p=past, Poss=Possessive, pr=present, Top=Topic.
4. Notice how the articles (*the* and *a*), plural markers, and prepositions are deleted in Korean. This might show why Koreans have great difficulty learning to use them appropriately even when their level of English is advanced.
5. This is similar to paratactic use of *because* in conversational data from English (Schleppegrell 1991).
6. See Hwang (1990b) for further discussion of the relative clause in narrative.
7. In chaining languages, a clause chain can be composed of a series of clauses, only one of which is an independent clause with a fully inflected verb for tense and modality.

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X

SOCIOLINGUISTICS

LEXICON AND CULTURE: THE CASE OF COLLEGE SLANG

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In historical linguistics, the importance of the lexicon as an indicator of culture is acknowledged. As Calvert Watkins says in his well-known essay on "Indo-European and the Indo-Europeans" in The American Heritage Dictionary, "Though by no means a perfect mirror, the lexicon of a language remains the single most effective way of approaching and understanding the culture of its speakers" (2084). In much the same way that historical linguists examine the preserved or reconstructed lexicon of a group of people of the past for clues to their culture, this paper examines the content of a corpus of American college slang. The corpus consists of examples of "good, current campus slang" submitted by students enrolled in introductory English linguistics courses at the University of North Carolina at Chapel Hill in twenty-nine consecutive semesters, from Fall 1976 through Fall 1991.

In looking over the six-thousand or so tokens in the corpus, I tried to envision the community of speakers who used these words and phrases as if this lexicon were my only source of knowledge about them. What I noticed right away was that these speakers seem to like words, for they often have many words and phrases for the same notion, for example, budget, bush, cheezy, crappy, dip-shitty, doy, generic, gnarly, heinous, lame, low-rent, nappy, and slack to give a negative evaluation of something.

As a group, they also seem to be afflicted with bipolarism, for they have multiple words for both 'performing well' and 'failing', for both 'high spirits' and 'low spirits', for both 'enthusiastic approval' and 'intense condemnation'. The middle ground is almost lexically unoccupied. They have a penchant for ironic interpretation, and sometimes they use a negative word like bad or wicked to mean 'excellent'. Judging from the lexicon, they are given to excesses--eating rapidly and in great quantities (porking out), drinking alcohol to the point of impaired vision (beer goggling), depriving the body of sleep for days at a time (pulling all-nighters).

From the lexicon it is difficult to tell what they do for a living, though a small set of words pertaining to books, libraries, studying, and taking

tests suggests that they might be engaged in learning. But just as many words suggest that they might be critics of music, television, or films--or perhaps professional tasters of beer.

They are attuned to the attitude and behavior of other members of the group and have many words to censure errant people and situations, for example, that bites or that sucks. They also have many expressions to give advice to (get with the program) and to commiserate with one another (I'm hating it.).

Their kinship system bears investigation, as bro, sister, and homey (from homeboy/homegirl) are the primary terms.

The users of this lexicon do not seem to have a high regard for animals, for almost all of the animal words are used to point out unfavorable qualities in humans. Dogs, in particular, serve as the basis of a number of negative expressions, from dog itself for 'unattractive female', to mad dog for 'cheap liquor', to turd poodle for 'loser'.

Terms of destruction and violence are prominent in the corpus, particularly referring to drinking, competitive physical and mental activities, and sex. The users of this lexicon must view the physical union of male and female as an unpleasant activity, for it is called by such names as boning, bonking, bouncing refrigerators, bumping uglies, doing the nasty, getting parts, greasing, hitting gut, hitting it, hosing, jumping bones, scrogging, and slamming. The 'extreme of ugliness' is fugly, a blend of the most common taboo word for 'sexual intercourse' and ugly. By contrast with the barrage of words for the activity that results in procreation, there is only one term for 'pregnant' in the corpus, the well-known vernacular expression knocked up.

The time and space constraints of this paper do not allow me to continue traipsing through the lexicon, commenting willy-nilly on the various items that suggest something interesting about the culture of the speakers. Instead let us focus on a sizeable and coherent subset of the corpus, ninety-three lexical items culled by Elisa Fiorenza as part of her undergraduate honors thesis in statistics in 1992. These ninety-three items, listed in the Appendix, are all of the slang terms from Fall 1976 through Fall 1991 with at least one synonym of ten(+) frequency submitted by at least ten students in at least one semester.¹ I estimate that, taken together, they constitute from one-fourth to one-third of the tokens in the entire corpus.

Fiorenza found that the ninety-three slang terms fall into twenty-seven groups by meaning.

Meanings are indicated in the appendix by a simplified gloss. The appendix lists the slang items under their gloss, with the number of slang items in each category given in parentheses. Thus, the gloss (or meaning) represented by the greatest number of slang terms from 1976 through 1991 is 'excellent', followed by 'socially inept person', 'drunk', 'attractive person', and so forth.

The meanings of these ninety-three slang items suggest a community of speakers concerned with relationships among people, particularly with judgments of acceptance or rejection. Fourteen words mean 'excellent' or 'attractive', and another four mean 'attractive person'. Three categorize people as members of the fraternity/sorority social set. There are fourteen terms that apply to people who do not meet approval, either because they are socially inept or are out of touch with reality. In all, thirty five items--over one-third of the list--pertain to judgments of approval or disapproval. The eight expressions for 'insult', 'get in touch with reality', and 'lose control' likewise imply a standard of behavior that someone does or does not live up to.

Two items mean 'the worst situation', and the two intensifiers ---from hell and mega can make a scalar commodity more extreme.

On the basis of this lexicon, what is it that the speakers do? They 'do well' or 'fail'; 'have a good time', 'disregard' things, and 'relax'. They adopt linguistic fads from the mass media. They 'eat rapidly', 'pursue others' with sexual designs, and engage in physical intimacy. They get 'drunk' and 'exhausted'. Nevertheless, they observe the forms of social interaction, bidding each other hello and goodbye and taking their leave on departing. Finally, they study.

Looking at the list by grammatical category gives a similar picture. Thirty-five are verbs; twenty-six, adjectives; twenty-one, nouns; and eleven, other. Two verbs imply a life of physical and mental tasks in which people can either succeed or fail. In addition, physically, they 'eat rapidly', 'have a good time', 'relax', 'leave' a location, 'pursue' romantic interests, engage in physical intimacy with others, and get 'drunk'. Linguistically, they 'insult' others. Mentally, they 'disregard' others, 'get in touch with reality', 'lose control', and 'study'.

Of the twenty-six adjectives, more than half (fourteen) are evaluative and positive. In addition, ten describe the physical states of drunkenness and exhaustion, and two refer to the mental condition of being 'out of touch with reality'.

Unlike the adjectives, which tend to be positive, the twenty-one nouns mainly name people and situations that do not meet approval--persons who are 'socially inept' or 'out of touch with reality' or situations that are the 'worst'. Although nineteen of the twenty-one nouns refer to persons, only four designate an 'attractive person'. None of the nouns names a physical object, which is interesting in the age of Madonna the Material Girl and the yuppy philosophy of "the one with the most toys at the end wins."

Linguists are always loathe to argue from the absence of lexical evidence. However, the limited range of meanings expressed by such a large portion of the college slang vocabulary and the lack of lexical resources in slang to talk about many important human experiences confirm that slang is vocabulary for a special purpose. One cannot go about the business of living using only slang. Slang is alternative vocabulary for a narrow range of human experiences, those that pertain to identifying oneself as a part of a group and remaining a member of good standing in the group.

The results of this exercise in lexicon and culture are not surprising. They simply verify that slang is primarily social. Despite the academic, political, and increasing financial concerns of college students, the distinctive vocabulary that they choose to use addresses mainly their need to feel connected with one another.

NOTES

1 Fiorenza found 132 terms that were submitted by ten or more students in a given semester. But since her goal was to investigate the way different terms enter the lexicon and replace other terms of the same meaning, she excluded the thirty-nine terms that failed to have the same meaning as another term with a frequency of ten or higher.

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Appendix

Slang Items with at Least One Synonym
 Submitted by at Least Ten Students in One Semester
 Fall 1976-Fall 1991*

`excellent' (11) awesome bad bitchin' cool fresh key killer solid sweet tough wicked	`drunk' (9) blitzed buzz(ed) catch a buzz fried ripped shitfaced toasted trashed wasted
`socially inept person' (10) dork dweeb geek goob(er) groover nerd spaz turkey whimp, wimp wus(s)	`attractive person' (4)</p> <p>babe</p> <p>chick</p> <p>fox(y)</p> <p>hunk</p> <p>`insult' (4) dis dog rag (on) slam
`relax' (4) chill chill out cool out veg (out)	`greeting' (4) 's up what's happening what's up yo
`attractive' (3) fine hot phat	`do well' (3) ace blow away get off
fads (3) not `negation'</p> <p>psyche `fooled you' word up `agreement'	`frat./sor. member' (3) bagger fratty bagger sue, susie, suzi

`have a good time' (3) jam(min')	`leave' (3) blow bolt book (it)
`kiss passionately' (3) grub hook (up) scrog	`disregard' (2) bag (it) blow off
`eat rapidly' (2) pig out scarf	`exhausted' (2) beat burned out
`fail' (2) bomb flag	`farewell' (2) check you later later
`get in touch w/reality' (2) get a clue get a grip	`intensifier' (2) _____ from hell mega
`lose control' (2) freak (out) wig (out)	`out of touch' (2) clueless spaced (out)
`person out of touch' (2) airhead space cadet	`pursue for sex' (2) scam scope, scoping
`study hard and late' (2) book (it) cram	`worst situation' (2) bummer (the) pits

*Data adapted from Elisa Fiorenza, "A Statistical Analysis of Patterns of Slang Usage at the University of North Carolina at Chapel Hill from Fall 1976 to Fall 1991," Undergraduate Honors Thesis, Department of Statistics, University of North Carolina at Chapel Hill, 1992.

SEX-DIFFERENTIATION IN THE USE OF ENGLISH:
A LINGERING MYTH?

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Introduction

Do men and women use English differently? Yes, they do. This is the answer found in ancient folklore and in modern anecdotes and cartoons; it is the conclusion (based largely on introspection and conjecture, it is true) reached by noted linguists such as Otto Jespersen and Robin Lakoff; and, perhaps most surprisingly, it is the consensus of native English speakers.

Jespersen's (1922) and Lakoff's (1975) hypotheses of sex-preferential differentiation in English usage appear to be based substantially on anecdotal evidence and longstanding stereotypes about the way men and women use language differently. According to these sources, women are likely to speak more, and to do so less directly and using simpler language, than men; to ask more questions and to fail to complete utterances and ideas; to use prescriptive forms of grammar and pronunciation, euphemistic expressions, tag questions, hedges, and the like; and men are more likely than women to use slang expressions and to swear. Many of these commonly accepted ideas about sex-based differences in the use of English have been subjected to empirical study in order to determine whether they reflect the way people actually talk (see, for example, Dubois and Crouch 1975; Swacker 1975; Ursel 1989; Prideaux, Hogan, & Stanford 1992), but empirical tests have, for the most part, failed to substantiate the claims.

In spite of the lack of hard evidence to support the theory, the perception that men and women use English differently persists. Perception studies have shown that naive subjects regularly ascribe speech characteristics to one sex or the other on the basis of the language used. Studies by a number of researchers (cf. Kramer 1974; Edelsky 1976; Siegler & Siegler 1976; Dyck 1990) have demonstrated a marked tendency on the part of children and adults of both sexes to assign statements containing alleged features of women's language to female speakers and statements containing alleged features of men's language to male speakers.

In studies of this kind, subjects are often asked to identify a number of speech characteristics (such as

the use of tag questions, slang, swearing, or prescriptively correct forms of grammar) as more likely to be used by male or female speakers; alternatively, they might be required to judge the sex of the speaker of captions from cartoons, which are intrinsically stereotypic, or of short statements manufactured specifically for the occasion. None of these methods provide a context within which the subject can make an informed decision as to speaker sex; moreover, the stimuli are often unnatural sounding and usually short, typically ranging from a single word or phrase in the first type of study to a relatively simple sentence in the last. Perhaps we should not find it surprising, then, that judgements of speaker sex usually conform to stereotype, since the methods employed typically leave subjects no recourse but to draw on their knowledge of stereotypes of sex-based speech behaviour in making their judgements. Would the results differ if subjects were asked to judge the sex of the speaker of a large sampling of longer passages taken from actual oral and written discourse? This was the question which motivated the study reported in this paper.

The hypothesis was formulated that the sex of the speaker or writer of discourse is not predictable when prediction must depend solely on the written form of the language used. This hypothesis was tested in the context of twelve variables identified by Jespersen and Lakoff as more prevalent in male speech or in female speech. The variables represented in the stimuli are:

1. Use of simple coordination to link sentences and clauses
2. Use of incomplete sentences
3. Use of indirect request forms
4. Use of tag questions
5. Use of grammatically proper forms
6. Use of swearing
7. Use of hedges
8. Use of "empty" adjectives
9. Use of intensifiers
10. Use of hyperbole
11. Use of euphemism
12. Use of slang

All but two of these variables are commonly associated with female speech; this is not by design but is rather a result of the greater tendency for women's speech patterns or habits to be singled out as the non-normal case. The two exceptions are the use of swearing and the use of slang, which are typically associated with male speech.

Method

Eight passages were selected from written and spoken English to represent each of the twelve variables listed above. A neutralized version of each passage was then constructed by minimally altering the portion of the passage identified as associated with male or female speech. For each of the resulting passage pairs, one exemplar (the "marked" version) was intended to reflect a particular stereotype of, or association with, male or female language use, while the other (the "neutral" version) was intended to reflect the absence of that stereotype. A thirteenth set of eight paired passages, all of which could be considered neutral in terms of sex-differentiation in English usage, was added to act as a control.

The resulting set of 104 paired passages were incorporated in random order into a test booklet, with the restriction, however, that every group of thirteen stimuli must contain a pair of passages for each of the thirteen variables. The order of presentation of the passages within a pair was also randomized such that, for half of the stimuli, the neutral version of a passage was presented first while, for the other half, the marked version was presented first. For each pair of passages, only one version would be judged: this would be the neutral version for half of the stimulus pairs and, for the other half, the marked version. The passage to be rated in terms of speaker sex was presented as the first member of a pair of passages in half of the stimuli (Order 1), and as the last member in the other half (Order 2). An asterisk was used to indicate which passage in each pair of passages was to be judged.

A second booklet was prepared to contain the responses of individual subjects. This answer booklet contained, for each stimulus in the test booklet, a seven-point scale on which subjects would record their judgments of the sex of the speaker of the stimulus passage. Half of the subjects made their judgments on a scale that was anchored as 1 = Male and 7 = Female, and the other half used a scale where 1 = Female and 7 = Male. Thus two scale conditions existed. On the last page of the answer booklet, space was provided for subjects' comments.

Ten male and ten female native English speaking University of Alberta students aged 19 to 25 served as the subjects for this experiment. The subjects were told that the test booklet contained a number of passages, some of which had been spoken or written by men, and some by women. They were instructed to read each pair of passages carefully, then read the one marked

with an asterisk again and decide whether it was originated by a man or a woman. The subjects were asked to record their judgements by circling the appropriate number on the scale provided in the answer booklet.

Subjects took on average 35 minutes to complete the experiment.

The data were tabulated and analyzed for individual subjects' responses, and a multiple factor repeated measures analysis of variance was conducted to test for significant differences due to the following factors:

1. Scale: which of the two scales was used
2. Sex of Subject
3. Variable: which of the thirteen variables was being rated
4. Version: whether the neutral or marked version of a passage was being rated
5. Order: whether the stimulus passage was presented as the first or second member of a passage pair

Pairwise comparisons were conducted (using Tukey's Honestly Significant Difference tests) for those factors and interactions among factors which showed significant differences.

Results

The results of the initial analysis of variance showed that Scale was a determinant in every significant interaction among factors. Consequently, the decision was made to simplify the analysis by rescaling the individual scores obtained on Scale 2 to match Scale 1 criteria; thus, all scores would now be analyzed in terms of a single seven-point scale anchored as 1 = Male and 7 = Female. A second analysis of variance was then run, this time based on the four remaining factors. The major significant main effects and interactions among factors, as identified by the analysis of variance, were:

1. Sex of Subject ($F = 5.69$, $p < .05$)
2. Version ($F = 28.40$, $p < .0001$)
3. Version X Sex of Subject ($F = 5.24$, $p < .05$)
4. Variable X Version ($F = 38.18$, $p < .0001$)
5. Variable X Version X Sex ($F = 4.59$, $p < .0001$)
6. Variable X Version X Order ($F = 4.39$, $p < .0001$)

Each of these will be discussed in turn below.

(1) Sex of Subject. Male and female subjects differed significantly in their judgements, with male subjects

rating the stimuli as overall more male-like (with a mean score of 3.89), and female subjects rating them as overall more female-like (with a mean score of 4.08). The role of subject sex and its interaction with several of the other factors will be discussed further under (3) and (5) below.

(2) Version. The subjects in this study differentiated significantly between neutral and marked versions of stimuli, with neutral versions receiving a combined mean rating of 3.84 and marked versions receiving a combined mean rating of 4.13.

(3) Version X Sex of Subject. The means showing the significant interaction between stimulus version and sex of subject are given in Table 1 below.

=====
 Table 1
 Version X Sex of Subject

<u>Version</u>	<u>Sex of Subject</u>	
	<u>Male</u>	<u>Female</u>
Neutral	3.69	4.00
Marked	4.10	4.17

=====

Subject sex was identified earlier as a significant main effect. Pairwise comparisons of the means in Table 1 show that male and female subjects differed significantly in the way they rated the neutral (but not the marked) versions of stimuli, with females rating them as truly neutral in terms of speaker sex (at 4.00), while males rated them as more like male language (at 3.69). These results show a tendency on the part of male subjects to stereotype on neutral forms, a tendency which is lacking in the judgements of marked (for the most part, female) forms. This suggests that males are responsible for stereotyping in the use of language as examined here. As a result of the way male subjects rated the neutral stimuli, the overall mean scores of male, but not female, subjects displayed a significant differentiation between neutral and marked versions of variables.

(4) Variable X Version. Table 2 below contains the mean scores resulting from the significant interaction between variable and stimulus version.

Table 2
Variable X Version

Variable	Version	
	Neutral	Marked
1	4.38	3.60
2	3.91	3.83
3	2.78	5.04
4	3.15	4.96
5	3.58	4.50
6	5.39	2.38
7	4.24	3.41
8	3.04	5.24
9	3.55	5.08
10	4.31	4.23
11	3.33	5.04
12	4.66	2.39
13	3.68	4.03

Pairwise comparisons of these means show that, of the twelve variables under examination here, eight were rated significantly differently between versions; this included both male variables (6 - swearing, and 12 - slang) as well as six of the female variables (namely, 3 - indirect request forms, 4 - tag questions, 5 - grammatically proper forms, 8 - empty adjectives, 9 - intensifiers, and 11 - euphemism). In addition, both the neutral and marked versions of the male variables were rated significantly differently from those of the six female variables mentioned here.

(5) Variable X Version X Sex of Subject. The mean scores resulting from the significant interaction between variable, stimulus version, and subject sex are contained in Table 3 on the following page.

It was shown earlier (in the discussion of the means in Table 1) that male, but not female, subjects' ratings of neutral and marked versions of stimuli were significantly different when variable was not a factor. Pairwise comparisons of the means in Table 3 show, however, that when the mean scores for individual variables were considered, male and female subjects differed significantly only in the way they rated variable 2 (use of incomplete sentences). Subjects of both sexes attributed the neutral versions of this variable (passages which contained complete sentences) to speakers of their own sex, and the marked versions (passages

containing incomplete sentences) to speakers of the other sex.

Table 3
Variable X Version X Sex of Subject

Variable	Version			
	Neutral		Marked	
	Male	Female	Male	Female
1	3.98	4.78	3.80	3.40
2	3.28	4.55	4.63	3.03
3	2.73	2.83	4.60	5.48
4	3.10	3.20	4.63	5.30
5	3.50	3.65	4.10	4.90
6	4.90	5.88	2.70	2.05
7	4.10	4.38	3.43	3.40
8	3.18	2.90	5.20	5.28
9	3.75	3.35	4.75	5.40
10	4.43	4.20	4.03	4.43
11	3.33	3.33	4.90	5.18
12	4.25	5.08	2.60	2.18
13	3.43	3.93	3.90	4.15

Table 4
Variable X Version X Order

Variable	Version			
	Neutral		Marked	
	Order 1	Order 2	Order 1	Order 2
1	4.35	4.40	3.78	3.43
2	3.68	4.15	3.70	3.95
3	2.58	2.98	5.00	5.08
4	2.73	3.58	5.15	4.78
5	3.73	3.43	4.63	4.38
6	5.35	5.43	2.83	1.93
7	4.13	4.35	3.45	3.38
8	3.48	2.60	4.80	5.68
9	3.93	3.18	5.43	4.73
10	4.35	4.28	4.45	4.00
11	3.75	2.90	4.93	5.15
12	4.55	4.78	2.20	2.58
13	3.73	3.63	3.90	4.15

(6) Variable X Version X Order. Table 4 on the preceding page contains the means resulting from the significant interaction between variable, stimulus version, and order of presentation.

Pairwise comparisons of the means in Table 4 show that the order in which the two passages in a passage pair were presented was a significant factor in the judgements of two of the variables. The neutral versions of variable 8 (empty adjectives) were rated as significantly more male-like when the stimulus was presented as the second passage in a pair (Order 2); as well, the marked versions of variable 6 (swearing) were judged to be significantly more male-like, and those of variable 8 (empty adjectives) more female-like, when presented in Order 2.

Conclusions

The hypothesis tested in this experiment was that native speakers of English would not be able to predict the sex of the speaker or writer of orthographically-presented passages from oral and written discourse. The results reported in the previous section show that, for the majority of the variables tested here, subjects judged passages containing variables stereotypically associated with female language use as more likely to have been spoken by a female, and passages containing variables stereotypically associated with male language use as more likely to have been spoken by a male. Moreover, the neutralized versions of these passages were typically assigned to speakers of the other sex. Thus judgements for the two versions of the majority of variables tended to be polarized, resulting in statistically significant differences in ratings between versions for eight of the twelve variables tested; these variables were:

3. Use of indirect request forms (F)
4. Use of tag questions (F)
5. Use of grammatically proper forms (F)
6. Use of swearing (M)
8. Use of 'empty' adjectives (F)
9. Use of intensifiers (F)
11. Use of euphemistic expressions (F)
12. Use of slang (M)

In addition, both the marked and the neutral versions of both male variables were also rated significantly differently from those of the female variables listed.

These results suggest that young native English speakers perceive differences in the way men and women use English even when the stimuli they judge consist of

passages from actual oral and written discourse. However, in light of the failure of empirical tests to provide conclusive evidence that the differences of repute exist in fact, one must ask whether native English speakers really believe that men and women talk differently. Although this possibility cannot be ruled out entirely, comments offered by a number of the subjects who took part in this study suggest otherwise. More than half of the participants reported that the experimental task made them feel uncomfortable, even sexist; they felt that they were guilty of sex-stereotyping in their assignments of speaker sex, and that their responses were not necessarily realistic. Some of the subjects' comments are offered below:

I felt that I was being biased - I didn't think that my answers were fair nor accurate (A-M5)

I felt that the judgements that I made were on stereotypical images of yesterday and this made me somewhat uncomfortable because I know in some of the cases it could have been a female as well as a male speaking (ie) females swear alot today, too (A-F4).

The experiment evoked many stereotypes of speech patterns in me (B-M5).

It's a rather unfair experiment; it's based on generalizations and stereotypes (B-F3).

Nevertheless, when asked on what they based their judgements, many of the subjects identified language that was flowery, vague, grammatically correct, polite, and trivializing as typical of female speech, and language that was crude, blunt, and forceful, and which contained incidences of swearing and slang, as typical of male speech. These are the differences of stereotype. It appears, then, that the subjects in this study made use of traditional notions of sex-differentiation in language use in their judgements of speaker sex. It is not clear, however, that they did so because they believed that the stereotypes of how men and women talk characterize how they actually talk; rather they seemed to be aware they were accessing stereotypic information in making the required judgements but felt somehow constrained to do so by the nature of the task. Perhaps they simply utilized the only method whereby they felt they could perform a task of this nature: that is, by accessing their knowledge of stereotypes.

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TOWARD A REDEFINITION OF FACE-THREATENING ACT

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1. Introduction: Politeness Theory and Discourse Management

Brown and Levinson in *Politeness: Some Universals in Language Usage* (1987) propose that an abstract sociolinguistic principle guides and constrains a speaker's choice of language in everyday discourse and that this principle explains the use of politeness phenomena in conversation. Central to this sociolinguistic principle is the concept of "face," a dimension of social interaction initially introduced by Goffman (1967) as "the positive social value [self-image] a person effectively claims for himself" and consistently attempts to maintain in interactions with others (15). Speakers, according to Brown and Levinson, come into any given conversation with two basic, somewhat conflicting, face wants. The first is the want to be free to act unimpeded by others and to have one's individual rights, possessions, and territories unfringed upon (called negative face wants); and the second is the want to be respected and liked by other people (positive face wants). Since the satisfaction of the speaker's wants is, to a large degree, dependent on the action of others, it is in the speaker's best interests to act with the understanding that the other participant in the conversation has the same basic wants; guided by this principle, the speaker attempts to satisfy his or her own individual wants while at the same time developing linguistic strategies that also acknowledge and recognize the wants of the other participant.

Conflict, then, can be understood as a potential ingredient of any interaction simply because social interaction by its very nature presupposes an intrusion into another person's domain, a person who often does not share the same goals, attitudes, interests, beliefs, or values of the speaker. Needless to say, once we do begin to converse, there are acts that we, as speakers, must do that by their very nature threaten the wants of another individual. Orders and requests, for example, threaten the hearer's want to be left alone to act unimpeded, while acts of criticism, disapproval, and disagreement threaten the hearer's want to be liked and respected. The speaker, too, can perform acts that are self-threatening: the expression of thanks or the acceptance of an offer, for example, in Brown and Levinson's system are acts that impinge on the speaker, for they impel future obligation; apologies and confessions, among other self-humiliating acts, reduce the positive self-image of the speaker. All these linguistic acts--acts which are inherently threatening to the speaker or hearer--become the principle unit of analysis in Brown and Levinson's model and are called face-threatening acts (FTAs).

As speakers, we learn to strategically manage our language, for if we foresee that an act will be potentially threatening to our hearer, we can redress this act in various ways. We can mollify it somewhat by making it sound less imposing, for instance, or we can precede it with polite conventional forms so that

our hearer will understand right away that we recognize and respect his or her wants. Another strategy that we can use is to appeal to our hearer's want for solidarity; we can re-emphasize our friendship and liking for our hearer or we can try to convince our hearer that we both have the same goals. However, a strategy that we most often use is the strategy of indirectness; we may, for example, hint that a threatening act is at stake, and let the hearer decide if this is what we really intended.

Due to its tremendous interdisciplinary appeal, Brown and Levinson's politeness model has been tested in a wide variety of fields, and a number of criticisms have been raised. A major criticism of the model, the one which is of primary concern to this paper, is the model's failure to reveal how face-threatening acts and politeness strategies interact sequentially with other acts in large segments of extended discourse. Brown and Levinson's model presupposes speech act theory as the framework for analysis in determining face-threatening acts: speaker acts are coded at the level of the sentence and classified according to whether the act threatens the speaker or hearer's face. Once an FTA is recorded, linguistic redressive strategies are then coded, too, at the level of the sentence, without consideration of the utterance's discourse environment. A significant weakness in the model is that utterances in which no inherent FTAs are found are discarded from the analysis. The point of the criticism is more methodological than anything else. If we accept that the face-threatening act is an important dimension to capture in an analysis of discourse, the question is how we can better characterize it in relation to other things that speakers do with their language in conversation. In particular, what critical insights about discourse management are missed if we code the FTA at the level of the sentence regardless of its relation to other acts within the discourse at hand?

In my view and others (Coupland, Grainger, and Coupland 1988, Fraser 1990, Kasper 1990, Sell 1991), Brown and Levinson's decision to isolate politeness phenomena from all other interactional phenomena in conversation is unmotivated. The same assumptions that Brown and Levinson claim underlie the use of politeness phenomena apply as well to the use of all language in face-to-face interaction. Indeed, both Goffman (1967) and Durkheim (1915)--whose works provide the larger social framework within which Brown and Levinson place their politeness model--discuss social behavior in terms of language in general rather than in terms of isolated linguistic acts.

Brown and Levinson's sociolinguistic principle is based on Durkheim's (1915) theory of social action, for it presumes that individuals in a society have a universal right to be treated by others in specified ways, a right that is upheld in the verbal activity that takes place between participants in social interaction. This right is, according to Durkheim, a religiously-based social phenomenon: members of societies perform conventionalized behavior in order to collectively express and maintain the symbolic importance of sacred objects, objects designated as worthy of dignity and respect, and having pure and extraordinary power. Most important is Durkheim's argument that the sacred is embodied in all individuals, that within each of us is a self-contained sacred center which all members collectively agree to be a domain that may not be encroached upon by others (259). Durkheim suggests that social rites, in reinforcing symbolic representation of the sacredness of the individual, provide a guide for action to

members of society on how they should behave toward the sacred object.

In his essays, Goffman (1967) elaborates on Durkheim's view of social interaction as ceremonial rite; he articulates how the ritual becomes re-enacted through the language of everyday social interaction. Individuals, according to Goffman, are motivated in conversation to maintain their own face in order to continually reinforce the symbolic representation of their sacredness but are also motivated to mitigate their threatening acts out of respect for the sanctity of the other individual. These rituals of face concern become one of the means by which societies regulate the collective behavior of the members out of protection for the dignity of each individual (Goffman 1967: 44).

This view of social interaction negates a model of politeness which views verbal acts in isolation of the discourse environment, for the face-threatening acts of participants which occur during the flow of conversation become intertwined sequentially with other face acts in a web of optimal ritual face "equilibrium" (Goffman 1967: 45). Face-threatening acts that form the basis of analysis in Brown and Levinson's model, then, cannot justifiably be studied when extracted from the social dynamic within which they are embedded. They can only be viewed as small pieces of larger social actions that become constructed through the succeeding moves of participants in conversation. The position I take is that the heuristics provided in Brown and Levinson's model to explain politeness phenomena may be extended to a model of discourse to explain a social dimension that is found in interactional phenomena in general. Participants in any given conversation employ linguistic strategies that are used to balance expressions of social solidarity with those of social reserve, distance, or social threat. Each succeeding move in a conversation is related to preceding utterances on the basis of this social meaning that gets constructed. What speakers do with their language conveys constructed social information that is necessary to our meaningful interpretation of their utterances.

2. The Data: Using Literary Dialogue for Linguistic Analysis

In this paper, I examine selected dialogue which transpires between Aziz and Fielding in Chapter 7 of E. M. Forster's *A Passage to India*. I examine the interpersonal dialogue of these two characters in much the same way that linguists study the interaction of speakers and hearers in naturally occurring conversation. My theoretical premise about the relation between language and literature is consistent with Pratt's (1977): since literary discourse is not "formally and functionally distinct from other kinds of utterances" (xii), a linguistic model that can describe and explain the use of language in non-literary situations should be able to account as well for how we understand language in literary contexts (xiii). Of particular interest to this paper is the manner in which speakers use abstract sociolinguistic knowledge (the knowledge of communicative principles and socially conventional norms) to make their own linguistic choices as well as to make sense of their interlocutor's utterances; an understanding of this knowledge enables linguists to explain how inferential social judgments are arrived at in interactive contexts.

In claiming that our knowledge of how to use and understand the language of conversation contributes to our knowledge of how to process and understand

meaning in literary dialogue, I am not presuming that the language of conversation is identical to the language we encounter in literary dialogue, nor am I presuming that writers meticulously reproduce in the speech of their characters exactly what occurs in everyday speech. Naturally occurring conversation, for instance, is not produced as fluently as the utterances we encounter on the literary page. The language of literary dialogue rather represents what more abstract analyses of ordinary conversation unveil: an underlying coherent dimension of conversational exchanges. In literary dialogue, then, we find not an exact transcription of everyday language but rather a representation of speech (Page 1988).

Of course, the dialogue between characters is only one dimension of literary discourse, and isolating it for analysis from other levels of discourse within which it is embedded provides a partial view of how literary dialogue distinguishes itself from ordinary conversation. A simple and obvious but significant difference between the language of conversation and the language of literary dialogue is that speakers intend independently of anyone else while characters do not; the speech that characters produce is not evidence of any willful act on their part but is rather a carefully crafted and carefully planned manifestation of what the narrator intends to show us. The contextual information that is assumed in literary dialogue is not boundless or random; a narrator sets parameters on our knowledge of the fictional world presented (Meyer 1983: 81).

But the narrator presents a mock reality for us, inviting us into feeling as though we are observers of real conversation. In addition to capturing syntactically the illusion of spontaneity, literary dialogue creates verisimilitude by requiring that the reader make meaning of the characters' utterances as if the characters were producing and negotiating their utterances in real-time. Since writers create the illusion of naturally-occurring conversation, literary text becomes a rich source of data for discourse analysts; indeed, writers make the knowledge of our communicative competence manifest. Through our analyses, we are able to observe how the intricate interaction of various aspects of speaker/hearer discourse knowledge accounts for meaning that is not inherent to the linguistic form of the utterance.

3. Analysis: Constative Speech Acts as Redressive Face Actions

At the end of Chapter 6 in *A Passage to India*, Aziz, a medical doctor in Chandrapore, returns home after having practiced his game of polo on the Maidan and finds a note from Fielding, Principal of the Government College, inviting him to tea. Even though the two characters have never met, Fielding a month prior had invited Aziz to tea, but Aziz had ignored the invitation, just forgetting to act, and in so doing committed a threatening act to Fielding's self-respect. Fielding's re-extension of the offer in Chapter 6 without mention of Aziz's previous threatening act committed against him ingratiates Fielding to Aziz. These prior face acts set the stage for Aziz and Fielding's first meeting in Chapter 7. Aziz arrives early at Fielding's tea-party ready to return to Fielding his deferential due.

Fielding's first remark to Aziz, "Please make yourself at home," (57) linguistically marks the beginning enactment of the invitational offer extended in his note; the utterance right away functions to establish social solidarity between host and guest. In Aziz's extended turn that follows, he includes a sequence of remarks which express constative speech acts, that is, actions which reveal him as

simply intending to express his beliefs about X to his hearer (Bach and Harnish 1979: 41). In Brown and Levinson's system, these actions are non-threatening to the hearer and so are dismissed from the analysis. However, if we analyze them in terms of face function, we see that the social actions performed are indeed a coherent response in this sequence of opening formalities.

Aziz's sequence of remarks can be understood, in other words, as functioning in response to his prior FTA of ignoring Fielding's first invitation prior to Chapter 6:

"The fact is I have long wanted to meet you," he continued. "I have heard so much about your warm heart from the Nawab Bahadur. . . ." He came close up to the door. "When I was greener here, I'll tell you what: I used to wish you to fall ill so that we could meet that way. . . . Then we would have had jolly talks, for you are a celebrated student of Persian poetry." (57)

Our impression of Aziz's officiousness in the opening sequences of this dialogue risks being dismissed as a cultural trait, a servility we would expect from an unworthy Muslim in the home of a socially more powerful Anglo-Indian. Yet, our understanding of the function of face ritual offers another explanation for Aziz's linguistic behavior that goes beyond social group differentiation: through his linguistic acts in his greeting of Fielding, Aziz right away takes the opportunity to tend to his important bit of business with Fielding of redressing his previous offensive action. In this extended sequence of constative acts expressed in his utterances, Aziz reconfirms the esteem and good-will that he holds for Fielding ("I have long wanted to meet you") since these are the very face wants that Aziz essentially attacked by ignoring Fielding's good-will invitation prior to Chapter 6. Aziz's utterances express constative acts, but acts that reveal the intent of Aziz to tend to Fielding's positive self-image. Aziz speaks of the respect that Fielding holds in the community (his "warm heart") and claims common ground with Fielding by presupposing that his friends (Nawab Bahadur) are Aziz's friends as well. Aziz's physical actions, his moving close up to the door, reinforce his linguistic acts of solidarity. Aziz closes his turn by claiming common ground once again with Fielding, for Aziz emphasizes their common interest in Persian poetry. He concludes that the two characters have much in common to share in a discussion; their common interest binds them.

In this sequence, we see that redressive strategies identified by Brown and Levinson at the sentence level apply as well across sentences. Aziz's individual remarks, even though they express constative speech acts which are inherently non-threatening, all function as a cohesive unit that redresses a previous face action. They are meaningful actions to the two characters precisely because they perform this social function.

4. Analysis: Constative Speech Acts as Face-Threatening Acts

As we have seen, since Brown and Levinson fail to investigate how FTAs interact sequentially with other face acts in large segments of extended discourse, they fail to account for the various functions of constative speech acts in terms of face action. The succeeding sequence reveals how Fielding's response to Aziz's extended turn can only be understood as face-threatening to Aziz if it is evaluated

in terms of the face acts expressed in Aziz's preceding utterances.

Aziz's long and extended turn full of high praise and celebration of Fielding is met by Fielding with a constative confirmative act, a terse and abrupt summation of Aziz's sequence:

"You know me by sight, then." (58)

Fielding essentially understates what Aziz has just told him: Aziz not only knows Fielding by sight; he claims he has heard and talked considerably about him, he has fantasized about him, and he has longed to share with him his interests in poetry. Fielding's remark is indirectly threatening to Aziz precisely because Fielding distances himself from the solidarity Aziz has just attempted to establish. Fielding has every opportunity to pick up and comment on the fact that the two characters share an interest in Persian poetry, yet Fielding drops the opportunity and fails to reconfirm the solidarity Aziz tries to establish. Instead, Fielding exhibits restrained social reserve, creating a sense of protective self-composure.

But Aziz responds by pursuing positive attention of his own. After all, he has just spent an extended turn extolling Fielding's fine qualities. Fielding, on his turn, failed to reciprocate in response. So Aziz makes a more direct attempt with the expression of a directive act, a face-threatening question:

"Of course, of course. You know me?" (58)

This is a bold and risky attempt, for it places both Fielding and Aziz in vulnerable positions. Fielding is now pushed into a corner to match the positive acclamation that Aziz has just presented to him: he will unwillingly need to offend Aziz, by virtue of the Quality Maxim, if the reality is different from what Aziz would like to hear. Fielding responds with the best redressive strategy he can use:

"I know you very well by name." (58)

He seeks agreement by intensifying the truth (the fact that he has heard of Aziz) with the adverbial *very well* and with the fact that he has heard of him often. But this attempt by Fielding to save Aziz's face is not received as a successful attempt. Aziz, in his next sequence of utterances, tries to save Fielding's face (for offending Aziz's face) as well as his own. Aziz's remarks essentially express constative acts that redress Fielding's offense; they justify why Fielding could not possibly act otherwise:

"I have been here such a short time, and always in the bazaar. No wonder you have never seen me, and I wonder you know my name." (58)

Aziz's sequence excuses Fielding by informing him that he does not receive Fielding's prior remark as a threatening act. He dismisses and excuses the remark, thus letting Fielding off the hook. He even re-interprets Fielding's remark and reverses the action of the discourse, for he expresses that he recognizes, instead of a face-threatening act, a praiseworthy action on Fielding's part, the fact that Fielding knows Aziz's name at all. Aziz's sequence of remarks provide Fielding with an out, thereby allowing the conversation to proceed elsewhere.

The opening dialogue of Fielding and Aziz's first meeting, then, if analyzed in terms of our understanding of the social conventions of face ritual imposed on conversation, reveals a tight sequential ordering of actions around face concerns. It begins the enactment of the invitational offer and thus functions as a coherent unit of opening formalities in this dialogue. The face concerns of the participants are

established and played out between them, therein allowing the rest of the discourse to proceed in other directions.

5. *Analysis: FTAs as Acts of Solidarity*

The phatic communicative function of Fielding and Aziz's remarks interestingly is not restricted to the characters' opening and closing dialogic sequences. The body or middle of the dialogue constructed between the characters continues to perform a social function; indeed, we recognize topic as inconsequential to what the characters actually do socially with their language. It is the social action they construct through their language that carries the weight of their dialogue.

The opening formalities having reached a culmination, Aziz is the first to signal a new direction in the discourse:

"I say, Mr. Fielding?"

"Yes?"

"Guess what I look like before you come out. That will be a kind of game."

"You're five feet nine inches high," said Fielding. . . . (58)

In Brown and Levinson's system, Aziz's utterance, "Guess what . . .," is analyzed as a directive request, a face-threatening act (even though in the form of a playful command) since the act inherently puts pressure on Fielding to perform an action desired by Aziz. But Aziz's request is really, in terms of face action, a type of discourse offering. Aziz offers a proposal to Fielding that they both participate in a game together. Whereas Fielding's act of the invitational offer and Aziz's redressive actions dominate the opening sequence, here Aziz initiates a kind of offer in his turn, an act of solidarity attempting to engage Fielding in discourse with him. Fielding's response, "You're five feet nine inches high," coheres in a meaningful way in terms of face action for it becomes the performative acceptance of Aziz's discourse offering. The constative speech act that he expresses in the form of a descriptive about Aziz performs his part of the game and therefore expresses his acceptance to participate in this act of solidarity.

Fielding, after a few more turns of participation in the game, shifts the direction of the discourse away from the game to his more immediate concerns of getting dressed, for he suddenly informs Aziz that he has stamped on his last collar-stud. The face action that dominates this next sequence is the extension of yet another offer by Aziz:

"Take mine, take mine."

"Have you a spare one?"

"Yes, yes, one minute."

"Not if you're wearing it yourself."

"No, no, one in my pocket. . . ."

"Come in with it if you don't mind the unconventionality." (58)

Fielding's question, "Have you a spare one?", because it is a directive request, is understood as another threatening act in Brown and Levinson's system; yet, even though he is requesting information, Fielding, in this utterance, if we analyze it in terms of face, expresses a redressive rather than a threatening act—he expresses a reluctance to impose on Aziz. Fielding seeks assurance that the offer, the act of

solidarity, is not a great offer, not a great imposition to his new friend.

As we see, Aziz tends to Fielding's needs at his own expense. Aziz's face actions cohere across units of dialogue in a meaningful way, for Aziz's offer here is yet another way that Aziz manages to redress the threatening act he committed prior to Chapter 6. The formalities of due honor to face being over, the two characters at the end of this sequence express the solidarity that results from their linguistic interchange by physically moving closer toward one another, shaking hands, and smiling. The sequence serves as a concise unit that illustrates the manner in which the characters' utterances function to cohere around face concerns. The characters construct another message of good-will and solidarity that both characters understand.

6. Analysis: Constative Acts and Critical FTA Implicatures

The formalities and establishment of good-will now over, Aziz relaxes in the succeeding sequence of dialogue; he takes more risks in indirectly expressing his views about the Anglo-Indian community, suddenly introducing a shift in tone in the discourse:

"But I always thought that Englishmen kept their rooms so tidy. It seems that this is not so. I need not be so ashamed." He sat down gaily on the bed; then, forgetting himself entirely, drew up his legs and folded them under him. "Everything ranged coldly on shelves was what I thought." (58-59)

Aziz uses his turn here by directing the topic of the discourse to the immediate physical surroundings of the participants. He quickly uses this as a springboard for expressing his own personal beliefs and attitudes. Aziz expresses his FTAs indirectly, for in speaking of the Anglo community, he forces a referential connection with his hearer at hand, a member of the larger Anglo group. At the end of his turn, for instance, Aziz ascribes the quality "coldly" to the actions of the group to which Fielding belongs; by criticizing the group in selecting an ascriptive with negative connotations, Aziz implicates a threatening act to Fielding as well.

Aziz negotiates his own way out of this critical sequence, employing the concerns of the immediate situation to briefly redirect the focus of the discourse:

"--I say, Mr Fielding, is the stud going to go in?" (59)

After having threatened Fielding indirectly, Aziz now uses his turn to redress his FTAs, thus striving to achieve social equilibrium in the discourse. He uses his turn to tend to Fielding, to express renewed interest in Fielding's own immediate concerns. Fielding performs the acceptance of Aziz's offer to help him dress with a complaint, a rhetorical question:

"Why in hell does one wear collars at all?" (59)

Fielding's turn should be analyzed as the closing of the offer sequence (Fielding grumbles "as he bent his neck" (59)). However, Aziz responds to Fielding's remark with a constative informative act as though Fielding's utterance were a sincere request for information:

"We wear them to pass the police." (59)

Aziz, in other words, uses Fielding's remark as the opening move of a new sequence.

Aziz's choice of the pronoun *we* is intriguing for it markedly differentiates and contrasts itself from Fielding's choice of *one* in "Why in hell does one wear

collars at all?" Aziz's *we* has no preceding referent. For the first time in the dialogue, Aziz uses a linguistic expression that explicitly distances himself from the group of Anglos to which Fielding belongs. The *we* is non-inclusive; Fielding as addressee is not a member of the inclusive group to which Aziz belongs and to which he refers. The explicit referent of *we*, "natives of India," follows in the discourse:

"If I'm biking in English dress--starch collar, hat with ditch--they take no notice. When I wear a fez, they cry, 'Your lamp's out!' Lord Curzon did not consider this when he urged the natives of India to retain their picturesque costumes." (59)

Aziz's choice of pronouns *we* and *they* explicitly emphasizes the separateness of the social groups to which Aziz and Fielding belong. Aziz's critical motif becomes louder and longer in this sequence. He is critical of the Anglo police who mock the native dress of the Indians. Once again, Aziz's threatening critical act is implicated; by criticizing other members of the Anglo community, Aziz indirectly criticizes Fielding as member of that group.

Aziz ends the sequence on yet another critical note, again subtle and indirect:

"Sometimes I shut my eyes and dream I have splendid clothes again and am riding into battle behind Alamgir. Mr Fielding, must not India have been beautiful then, with the Mogul Empire at its height and Alamgir reigning at Delhi upon the Peacock Throne?" (59)

The sequence of utterances preceding this one expresses constative acts at the level of the sentence, primarily *informing* Fielding of Anglo actions toward the native Indians. In this sequence, the expression of yet another constative act, this time a suppositive in the first sentence, still does not *direct* Fielding, as hearer, to take any specific action. Aziz, though, follows these constatives now with a directive requestive speech act. This time he directs Fielding to assent to the criticism he upholds of the Anglos, for his utterance, in violating the Maxim of Relation, implicates a criticism of the present not-so-glorious Anglo domination of India by focusing on the glories of the India of the past. The closing units of dialogue between Aziz and Fielding thus contrast sharply with the opening sequences; Aziz's critical motifs begin to emerge here as a loud and dominant action.

7. Conclusion

The focus of my analysis in this study has been on the manner in which FTAs interact sequentially with other face acts in extended units of discourse. My point is that an analysis of the FTA as inherent to the speech act expressed in an utterance is a short-sighted view of the complex function of these actions. I suggest in this paper a separation of the notions of speech act and face-threatening act, for I argue that the speech act expressed at the level of the sentence is a reflection of a more complex and abstract system of face interaction that imposes itself on the discourse. Bach and Harnish (1979) identify two presumptions that operate between speaker and hearer in any given conversation (7): a linguistic presumption (that when S says X, H will be able to recognize the meaning of X); and a communicative presumption (that when S says X, it is mutually known that S

intends for H to recognize S's illocutionary intent). I argue that the communicative presumption must include another facet: the presumption mutually shared by S and H in any given conversation that when S says X, it is mutually known that S is doing it with recognizable face intent. Any linguistic utterance, then, must be considered in terms of face function: a threatening act may be expressed but so may a face-tending act or a redressive act or even a neutral act, for not all utterances may reveal strategic evidence of relevance to either of the participants' face.

In addition, in this paper I have argued that, since writers create the illusion of naturally-occurring conversation, literary text becomes a rich source of data for discourse analysts. Throughout this study, we have seen how E. M. Forster is able to create conversational verisimilitude in his literary dialogue. A writer is able to create the illusion of naturally occurring conversation precisely because writers and readers share considerable mutual knowledge about the conventions of language use. The writer is able to use and exploit these communicative conventions because he or she has the knowledge that the reader knows them and thus will make the required social inferences. This study confirms that natural language models, in describing those aspects of discourse that become shared mutual knowledge of speakers and hearers, can account for and explain how we, as readers, make sense of implicit meaning in dialogue and understand as coherent the line-by-line linguistic utterances of the characters.

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XI

**PSYCHOLINGUISTICS AND
LANGUAGE ACQUISITION**

ON EMPIRICAL VERIFICATION OF COGNITIVIST 'RADIAL' CATEGORIES

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Prototype effects have been noted in the psycholinguistic literature for quite some time. (Lakoff (1987) provides a good review of some of the relevant studies from the early 70s forward.) The prototype effect of central interest in this paper is **GRADIENCE**, which can be measured in terms of goodness-of-example ratings. Goodness-of-example ratings may be obtained in a variety of ways, either intra-subjectively or inter-subjectively.

Intra-subjective measures obtain a goodness-of-example rating from each S. One means is via direct rankings: 'Subjects are asked to rate, say on a scale from one to seven, how good an example of a category (e.g., **BIRD**) various members are (e.g., a robin, a chicken, etc.)' (Lakoff, 1987: 41). Another common method is to obtain indirect ratings via an S's reaction times (i.e., an S is assumed to be able to more quickly identify as category members examples which are closer to the prototype).

Inter-subjective measures obtain an overall goodness-of-example rating across Ss. Ss might be asked to freely produce examples of a given category, either via listing or making drawings; category members are then rated by the researcher according to frequency of occurrence in Ss' responses. Another method is to ask each S to make a *yes/no* judgement about each item on a list as to whether or not it is a member of a given category; goodness-of-example ratings are then obtained based on the frequency with which Ss overall respond *yes* to each item.

It should be stressed at this point that goodness-of-example ratings do not necessarily indicate degree of membership (relative to a category with a 'fuzzy' boundary), but may indicate centrality of membership (in a category with a clear-cut boundary) -- more on this below.

Lakoff (1987:45) stresses the importance of the claim that prototype effects like **gradience** are superficial and may result from a variety of causes. (In fact, he repeats this claim several times in *Women, fire, and dangerous things*.) He discusses two possible interpretations of prototype effects (both of which he asserts are erroneous): **THE EFFECTS = STRUCTURE INTERPRETATION** and **THE PROTOTYPE = REPRESENTATION INTERPRETATION**. The first involves a claim that Lakoff (1987:137), following Rosch (1978), rejects outright: that 'scalar

goodness-of-example ratings occur if and only if category membership is not all or none, but a matter of degree'. The second involves a claim, also explicitly rejected by Lakoff (1987), that 'categories are represented in the mind in terms of prototypes' and 'degrees of category membership... are determined by their degree of similarity [in terms of features or feature bundles] to the prototype'. It is clearly for this reason that Lakoff never uses terms (as a some other researchers have) such as 'prototype category' to refer to an entity like *bird* (see below), since he would claim that this would confuse the underlying cause with the observed effect.

Two underlying sources of prototype effects mentioned by Lakoff are the existence of (a) radial categories and (b) graded categories. According to Lakoff (1987), cognitive categories with a radial structure are very common (84). In addition, 'a radial category is represented... as a container..., and its subcategories... containers inside it. Noncentral categories... may have further center-periphery structures...' (287). Radial structures thus differ from simple graded structures, according to Lakoff, in more than one major respect. First, radial categories have clear boundaries (e.g., *bird*; 45); in contrast, the edges of graded categories are 'fuzzy', with different elements having different degrees of membership in it (e.g., *tall man*; 45, 287-8). Second, radial categories, unlike all other types, have an internal structure which produces prototype phenomena -- 'there need be *no fixed core* of properties' (Lakoff & Johnson, 1980:123) shared by the prototypical member of the category and its other members.

While the existence of prototype phenomena has been convincingly demonstrated over and over, no compelling empirical evidence has been put forth to show that prototype effects are due to more than one cause. Authors have in general used the same approach taken by Lakoff (1987) or Lakoff and Johnson (1980) -- in which logical arguments proceed from various examples provided by these authors themselves, much as generative semantics and other schools of philosophical linguistics have done for many years.

The current study attempts to validate empirically Lakoff's claimed distinction between radial and graded categories. Ss are 84 students in undergraduate linguistics classes at the University of Toledo (Ohio, USA).¹ The primary method of data collection involves inter-subjective goodness-of-example ratings obtained via *yes/no* judgements about each item on a list of potential category members.

Twenty-five Ss were presented with a list of ten items (*automobile, truck, motorcycle, train, airplane, submarine, bicycle, space shuttle, hot air balloon, and horse*) and asked to answer for each the question *Is a(n) _____ a vehicle?* (The order of items above and in Table 1 is by frequency of *yes* responses; on the list seen by Ss the order was randomized.) Table 1 (Tables 1-3 appear in an Appendix) summarizes

the Ss' responses. Here, 1s represent yes responses, 0s, responses of *no*. Each column shows responses to one of the above items; each row shows the responses of one S. Note that columns are sorted so that items receiving the highest goodness-of-example ratings (the most yeses) are on the left. Rows are sorted so that Ss with the broadest version of the category *vehicle* (again, those with the most yeses) are at the top. For example, the S whose responses are given in the twenty-fifth (last) row answered *yes* to *automobile* and *truck*, but *no* to the other eight items. The two differences between radial and graded categories mentioned by Lakoff (above) should show up clearly in such data.

First, there is the clarity of the category boundary supposedly possessed by radial categories. A clear boundary should be reflected by a pattern in which some columns have virtually all 1s (representing Ss' judgements for those items clearly inside the category), other columns, virtually all 0s (for those clearly outside the category). Some error in measurement (in the statistical sense) is to be expected, but this error should be small. In other words, data for a radial category should not reveal an item (i.e., a column) with a 50/50 or even, say, an 80/20 split of 1s and 0s. For some items, there should be (or very close to) a 100/0 split of 1s and 0s, for others, the split should be virtually 0/100.

Second, recall that radial categories are claimed to have no fixed core of properties, but rather, to possess 'an internal structure which produces prototype phenomena' (Lakoff & Johnson, 1980:123; already cited above). Although they are not discussed in as much detail by various authors, graded categories, one can assume, at least *might* possess such a 'fixed core of properties' not possessed by radial categories. Suppose for the moment that (i) graded categories do have a fixed core of properties, with a lower degree of category membership arising from an item's possessing fewer of those properties. Further suppose that (ii) as items exhibit a lower and lower degree of membership in the category, they do so by losing a core property (or a connected bundle of core properties). Admittedly, these are not *necessary* conditions of graded categories, but (a) they are *possible* conditions of graded categories, and (b) *if* they hold, they will reveal another clear distinction between graded and radial categories. How? If conditions (i) and (ii) hold for graded categories, then such categories will exhibit what statisticians call a 'unidimensional scale' (Hatch and Lazaraton, 1991:205). The presence of a unidimensional scale is detected by a procedure called 'Guttman scaling' or 'implicational scaling' (see below). Radial categories, in contrast, are *by definition* n-dimensional.

In the current study, therefore, data from supposed radial and graded categories is examined for the presence of a unidimensional scale. Four outcomes are possible. First, neither type of category may

exhibit a unidimensional scale, in which case we will know only that at least one of conditions (i) and (ii) does not hold for graded categories. Second, graded categories may exhibit a unidimensional scale and radial categories not, in which case we have some confirmation of Lakoff's claims. Third, both types may exhibit unidimensionality, in which case we have strong counter-evidence bringing Lakoff's claims into question. The fourth possibility, although theoretically possible -- that radial categories may exhibit unidimensionality and graded categories not -- seems very farfetched, since it is hard (if not impossible) to imagine what such results would mean; clearly they would also represent counter-evidence to Lakoff's claims, however.

The category *vehicle* was thought likely to have a 'fuzzy' boundary, and although the author could devise 'no fixed core of properties' for it, it was hypothesized to be a graded category. Thus, the data for *vehicle* should contain columns with varying degrees of split between 1s and 0s -- which it does (see again Table 1). Guttman scaling of Ss' responses should reveal a clear unidimensional scale of membership in the category *vehicle*, which it did, with a coefficient of scalability of .770 (values range from 0 to 1, a value greater than or equal to .60 being considered statistically significant). Data points in Table 1 which indicate a deviation from unidimensionality of scaling are marked with asterisks (*). These represent 'error in prediction' in the statistical sense: the fewer such points, the closer the coefficient of scalability will be to 1, the greater the number, the closer to 0.

A later experiment in exactly the same form (but with 28 new Ss) was based on two categories (*furniture* and *clothing*) thought more likely to have clear boundaries (like *bird*), and thus be better candidates for being radial categories. These, however, also showed a unidimensional scale of category membership, which again is consistent with their being *graded* categories, but not *radial* ones. The *furniture* items yield a coefficient of scalability of .787, the *clothing* items, a coefficient of scalability of .642, both significantly unidimensional. The *clothing* data is displayed in Table 2 (items tested were *shirt, sock, coat, scarf, shoe, hat, belt, necklace, pair of eyeglasses, and wristwatch*). In both data sets, items were presented to Ss in randomized order.

In a third such experiment, the author tested another cognitive category specifically named by Lakoff (1987:83) as an example of a radial one (*mother*). In this experiment, goodness-of-example ratings were obtained in much the same way, but rather than the terms (*step-mother, unwed mother, biological mother, adoptive mother, surrogate mother, birth mother, genetic mother, and foster mother*) having been used, Lakoff's definitions were adapted (Lakoff's definition for the *prototypical mother* was included in addition). For example, Lakoff provides the following definition (1987:83):

Birth mother: This is defined in contrast to *adoptive mother*; given an adoption ICM [idealized cognitive model], the woman who gives birth and puts the child up for adoption is called the *birth mother*.

In the instrument used in the current study, Ss were provided with the following instructions:

In each of the following cases, could Mary be referred to as the mother of the child in question? Circle "Y" for "yes" or "N" for "no".

One of the items looked like this:

Y N	Mary gave birth to the child and has put the child up for adoption.
--------	---

As in the other experiments, the order of the items under test was randomized. The data obtained is displayed in Table 3. This data, unlike that for the categories *vehicle*, *furniture*, and *clothing*, **does not exhibit a unidimensional scale**. The coefficient of scalability (.469) fails to achieve significance.² Such a result is consistent with *mother* being a radial category. Thus, a statistically significant difference has been shown between three examples of Lakoff's hypothesized graded category type and one example of his hypothesized radial category type.

However, the results obtained are still somewhat problematical. Recall that radial categories should show clear boundaries. This should be reflected in Table 3 by its having only columns each consisting almost entirely of 1s or 0s. No individual column should have anything like a 50/50 mix. Yet, *biological mother*, for example, has a roughly 65/35 split, *foster mother*, a roughly 40/60 split. A possible explanation lies in the fact that this study is based on inter-subjective data: i.e., it is possible that each S might possess a clear boundary for the cognitive category *mother*, while variation across Ss muddies this boundary. An experimental design in which data is obtained intra-subjectively and repeatedly (to test the reliability of each S's judgements over time) is the only way to resolve this question.

In the current study, an attempt was made in this direction. The experimental instrument for the category *mother* contained a second part in which Ss were instructed to

Rank the following phrases in terms of how much each one describes a person who is like a "real" mother. In each space, write a number from "1" to "8", using "1" for "most like a 'real' mother" and "8" for "least like a 'real' mother".

Following this directive was a list of eight items -- *step-mother*, *unwed mother*, and so on -- the same eight items for which Lakoff's definitions were provided in the first part (with the exception that the phrase *prototypical mother* was, for obvious reasons, not included). Four Ss failed to follow directions on the second part; so here, $n = 25$.

Three things were done with the data thus obtained. First, the correlation among Ss' rankings was found via Kendall's W , with $W = .45$ (Kendall's W , like the coefficient of scalability, ranges from 0 to 1). The significance of W is measured as a Chi-square value, which in this case was 78.37 (d.f. = 7), which is significant at $p \leq .001$. I.e., while Ss' rankings do not all follow one pattern, the correlation is highly significant.

Second, frequencies of rankings were compiled for each item. Some of the distributions appeared to be bi- or tri-modal. For example, the following shows how many Ss gave *unwed mother* each ranking from '1' to '8': 1-4 Ss, 2-9, 3-2, 4-6, 5-0, 6-0, 7-2, 8-1. I.e., Ss were not all using the same criteria (one is tempted to read 'core properties') to formulate their responses.

Finally, the rankings for the phrases were compared against the *yes/no* judgements obtained for the corresponding definitions in the first part in order to see how well Ss' responses to the two tasks agreed. (Recall that while Lakoff's definition for *prototypical mother* was provided in the first part, there was no corresponding phrase for it in the second part.) Now, suppose a given S has three *yes* responses among the remaining eight definitions in the first part. If the two parts of the instrument are in complete agreement, we would expect the three corresponding phrases in the second part to be ranked somewhere between '1' and '3'. In fact, fewer than 30% of the Ss had complete agreement between their responses to the first part and those they gave to the second part. All items (*step-mother*, *birth mother*, etc.) contributed at some point to disagreements in responses between part one and part two (on two items the disagreement amounted to 33%). These disagreements may derive from inaccuracies in Lakoff's definitions or this researcher's adaptations of them -- or from the fact that the definition-based task excludes connotative values that are present in the phrase-based task.

In sum, it must be noted that the relatively small number of categories compared in the current study does not afford a sufficiently strong basis to say that a difference has once and for all been demonstrated empirically between radial and graded categories. Further cognitive categories need to be identified as not adhering to a unidimensional scale when the Guttman scaling procedure is applied (i.e., ones that can produce a result not consistent with its simply being graded rather than radial). According to Lakoff (1987:291), related meanings of any polysemic word / morpheme 'can be seen as forming

a radial category'. Further research might present Ss with a 'head' lexical item (the category) and a number of other items (known by the researcher to be attested synonyms -- its members); Ss would judge the other items to be included / not included in the set of (potential) synonyms. If Guttman scaling applied to these other items fails to reveal a unidimensional scale, it will mean another result consistent with the existence of a radial category and inconsistent with results so far (and repeatedly) obtained for graded categories. Such a result would also help to more clearly confirm the existence of radial categories as a separate type resulting in prototype effects.

NOTES

¹I extend thanks to colleagues (Dorothy Siegel and Samir Abu-Absi) who generously allowed me to draw some data from their classes and, of course, to all the students who volunteered their participation.

²Due to a data coding error, the result reported at LACUS XX showed a coefficient of scalability for items in the *mother* category of .625, which would have shown unidimensional scalability had it been correct. As embarrassed as the author is by this error, he is certain to be made more so when he finds (as he is sure he will) that some colleagues who were quick to doubt the validity of the negative result re radial categories will now less critically welcome the one currently being reported.

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APPENDIX: TABLES 1 - 3

MORE SO				<----->		LESS SO			
a	t	m	t	a	s	b	s	h	h
u	r	o	r	i	u	i	p	o	o
t	u	t	a	r	b	c	a	t	r
o	c	o	i	p	m	y	c	a	s
m	k	r	n	l	a	c	e	i	e
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1	1	0
1	1	1	1	1	1	0*	1*	0	0
1	1	1	1	1	1	0*	1*	0	0
1	1	1	1	1	1	0*	1*	0	0
1	1	1	1	1	0*	1	0	1*	0
1	1	1	1	1	1	0	0	0	0
1	1	1	1	1	0*	1*	0	0	0
1	1	1	1	1	0*	1*	0	0	0
1	1	1	1	1	0*	1*	0	0	0
1	1	1	1	1	0*	1*	0	0	0
1	1	1	1	1	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0

Table 1. Goodness-of-example data for *vehicle*.

MORE SO				<----->		LESS SO			
s h i r t	s o c k	c o a t	s c a r f	s h o e	h a t	b e l t	n e c k l a c e	p r e y	w r i s t
1	1	1	1	1	1	1	0	0	0
1	1	1	1	1	1	1	0	0	0
1	1	1	1	1	1	1	0	0	0
1	1	1	0*	1	1	1	1*	0	0
1	1	1	1	1	1	1	0	0	0
1	1	1	1	1	1	1	0	0	0
1	1	1	1	1	1	1	0	0	0
1	1	1	1	1	1	1	0	0	0
1	1	1	1	1	1	1	0	0	0
1	1	1	1	1	1	1	0	0	0
1	1	1	1	1	1	0	0	0	0
1	1	1	1	0*	1*	0	0	0	0
1	1	1	1	0*	0	1*	0	0	0
1	1	1	1	1	0	0	0	0	0
1	1	1	1	1	0	0	0	0	0
1	1	1	1	1	0	0	0	0	0
1	1	1	0*	1*	0	0	0	0	0
1	1	1	0*	1*	0	0	0	0	0
1	1	1	0*	1*	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0
1	0*	1*	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0

Table 2. Goodness-of-example data for *clothing*.

MORE SO				<----->				LESS SO
p r o t o	u n w e d	a d o p t	s t e p	b i r t h	s u r r o	b i r o o	f o s t e	g e n e t
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1	0
1	1	1	0*	1	1	1	0	1*
1	1	1	1	1	1	1	0	0
1	1	1	1	1	1	1	0	0
1	1	1	1	1	1	1	0	0
1	1	1	1	1	1	1	0	0
1	0*	1	0*	1	1	1*	0	1*
1	1	0*	0*	1	1	1*	0	1*
1	1	1	1	1	0*	0	1*	0
1	1	0*	0*	1	1	1*	0	1*
1	1	1	1	1	1	0	0	0
1	1	0*	0*	1	1	1*	0	1*
1	1	1	1	0*	0	0	1*	0
1	0*	0*	1	1	1*	0	0	1*
1	1	1	1	0*	0	0	1*	0
1	1	0*	0*	1	1*	1*	0	0
1	1	1	1	0	0	0	0	0
1	1	1	1	0	0	0	0	0
1	1	1	1	0	0	0	0	0
1	0*	1	1*	0	0	0	0	0
1	1	0	0	0	0	0	0	0

Table 3. Goodness-of-example data for *mother*.

AN AMENDMENT TO SAUSSURE'S PRINCIPLE I
based on empirical research
including:
REGULAR ICONICITY IN IRREGULAR VERBS

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Principle I

There is hardly a more often quoted tenet in the linguistic literature of the last half century than Ferdinand de Saussure's assertion in his famous Cours de linguistique générale (1916): "The bond between the signifier and the signified is arbitrary" (1959: 67). Perhaps Saussure's more concise wording has been more often quoted and referred to: "The linguistic sign is arbitrary," (1959: 67). Lesser known might be the fact that Saussure called it "Principle I." He appeared convinced that, "No one disputes the principle of the arbitrary nature of the sign..." (1959: 68).

Saussure stressed the significance of his doctrine even further: "Principle I dominates all the linguistics of language; its consequences are numberless. It is true that not all of them are equally obvious at first glance; only after many detours does one discover them, and with them the primordial importance of the principle." (1959: 68).

Iconicity

"The term 'icon' .. [has] the semiotic meaning ascribed to it by the philosopher Charles Sanders Peirce. According to Peirce, an icon is a non-arbitrary ... sign - that is, a designation which bears an intrinsic resemblance to the thing it designates" (Wescott 1980: 3).

Iconicity means the same as sound symbolism (Jespersen 1922/1964), phonetic symbolism (Sapir 1929) or phonosymbolism (Malkiel 1978).

In 1942, Jakobson was as yet exclusively using the terms, expressive and motivated words (1978: 112). In his and Linda Waugh's The Sound Shape of Language, however, they already used mostly the term sound symbolism and explained the practical reason why they preferred it over iconicity, while raising no objection to the term icon. In their definition, sound symbolism designates "an inmost, natural similarity association between sound and meaning ..." (1979: 178).

Malkiel interprets sound symbolism in the following manner: "An appeal to phonosymbolism simply means that the analyst endows the sound [or sounds] at issue with the ability to convey, in conjunction with other elements, a certain message of its own, with being...a carrier of a minor, if not necessarily minimal, semantic content" (1978:512).

A specific version of sound symbolism has been referred to as the phenomenon of phonesthemes by Weinreich (1963), by Householder (1946 and 1961) and Allott (1973). Both of the latter credit Firth (1937) with having coined the term phonestheme (1961: 21 and 1973: 13 respectively).

Arbitrariness versus Iconicity

Saussure's disarmingly logical-sounding, sweeping doctrine about the arbitrary nature of the linguistic sign has been virtually incorporated by linguistic academia and iconicity almost became anathema. Wescott hardly exaggerated when he regretfully stated that, "Since at least the time of Ferdinand de Saussure, most linguists have insisted that language is a system of exclusively ... arbitrary signs" (1980:3).

How accurate Wescott's observation was is indicated by the fact that even Jakobson, who three decades later most positively discussed the merits of sound symbolism (1979: 177-204), appeared to accept Saussure's principle I in his Six Lectures, presented in 1942 (1978: 110-15).

Quotes from two other eminent linguists illustrate the intensity with which many promulgated the Saussurean Principle I even much later: "Morphemes and morphemic constructions are connected to what they signify in an arbitrary and purely conventional way; if this were not so, all mankind would use only one language" (John Lotz 1961: 11). In the definition of iconicity, David Crystal found it necessary to make clear that there is no such thing in language: "Iconicity [is] a suggested property of some semiotic systems, but not language, to refer to signals whose physical form closely corresponds to characteristics of entities to which they refer" (1985: 151).

The 15th edition of The New Encyclopaedia Britannica reflects mid-twentieth century consensus of linguistic opinion regarding sound symbolism by quoting from Bernard Bloch and George L. Trager's 1942 Outline of Linguistic Analysis: "A language is a system of arbitrary vocal symbols..." (1974/1987: 566) and referred to this quote later, reemphasizing it: "for by far the largest number of words in a language there is no direct association between sound and meaning" (1974/1987: 578).

Textbooks have indoctrinated generations of linguistics students, imbuing them with the concept of pan-arbitrariness. Those who maintained an open mind were nevertheless infused with grave skepticism toward the idea of iconicity.

No wonder that so many linguists have accepted arbitrariness as a given. No wonder that the appropriately ambitious and superbly compiled and edited 1992 first edition of The Oxford Companion to the English Language echoes the Saussurian stance, "...there is no intrinsic link between the sound sequence of cow and the animal it refers to" (McArthur 1992: 610). (In generalized terms: There is no intrinsic link between the sound sequence of a linguistic sign and its referent: the signified segment of reality.) Verifying my earlier remarks, The Oxford Companion adds emphatically: "This is accepted as a tenet in linguistics" (McArthur 1992: 610).

Empirical evidence

The era in which de Saussure's Cours was published could be characterized as an age during which:

- (1) anecdotal evidence and abstract reasoning without statistical grounding had greater currency,
- (2) teachings of acclaimed scholars were more readily accepted in toto, without questioning individual components,
- (3) open-minded scholars were especially receptive of novel theses which offered liberating ideas such as the concept of arbitrariness.

These may be some of the presumably many reasons why the persuasive appeal

of Suassure's first principle rose high without the ballast of adequate empirical evidence.

Whatever the reasons for Principle I's meteoric rise, it was and continues to be firmly entrenched. The burden of proof now lies with the challenging theory.

During the last half century, criteria for scientific proof have become substantially more exacting. Jespersen defined the requirements for evidence to establish iconicity as one of the bases for linguistic genesis: "Future linguists will have to find out in detail what domains of human thought admit, what domains do not admit, of congruous expression through speech sounds, and further what sounds are suitable to express such and such a notion" (1922/1964: 398).

Roger Brown pointed to lack of sufficient research in this area, "After all these centuries of concern the most obviously relevant facts have not been collected" (1958: 135).

Ullmann offered analogous advice: "... it might be desirable to start with an extensive inventory ... sorting out scientifically established facts from dilettantish speculations" (1963: 178). Jakobson, who had meanwhile dropped the pro-arbitrariness attitude (revealed in his 1942 lectures), also urged empirical research, "...a possible similarity common to the sound-symbolic pattern of quite different languages... waits for a systematic verification" (1979: 180), adding: "...we face two urgent and responsible problems - the sound-symbolic typology of languages, and the sound - symbolic universals ensuing from such a typology..." (1979: 187).

David Crystal summed it up concisely, apparently prudently modifying his negative stance of just a few years earlier: "The examples of sound-symbolism are fascinating, but in the absence of frequency information about the phonological and lexical patterns in the various languages, it is not possible to arrive at a definitive interpretation... Far more descriptive data are needed..." (1987: 175).

Far more data

Decades of my extensive empirical research, including extensive lexico-statistical and contextual as well as experimental research, involving over 1,000 respondents, provides considerable evidence of iconicity. I analyzed 14 clearly defined, distinct semantic groups of verbs in two Uralic and three Indo-European languages: Finnish, Hungarian, English, German and Latin, and found amazingly similar and significant iconic systems in them. These findings were presented at the Sixth LACUS Forum (1979), the Seventh LACUS Forum (1980), the Eighth LACUS Forum (1981) and the Ninth LACUS Forum (1982), at the Symposium on Origins of Language, part of the World Conference of Anthropological and Ethnological Sciences, Vancouver, Canada (1983), and at the International Conference of the Language Origins Society, Oxford University, Oxford (1986).

The iconoclast must gather the full force of his evidence if he is to be persuasive. Rather than publishing each of my presentations piecemeal, I have bided my time and continued to expand my data base. I have added: (1) more semantic groups of verbs in the aforementioned languages (and found equally striking similarities); (2) selected groups of qualitative adjectives; (3) iconic functions of Hungarian verbal prefixes, marking intermittent action; (4) size-marking and speed-marking vocalic apophony in Hungarian nouns and verbs, extending well beyond the /i/'s well-known iconic role.

Vowel alternation

I have explored the striking phenomenon of vowel alternation in a group of Germanic verbs (called irregular in Dutch and English and named "strong" in German - a qualitative term, coined by Jakob Grimm). The iconic nature of vowel alternation in

Germanic irregular verbs is so obvious and this type of sound symbolism appears to be so significant that publication of this finding should be delayed no longer. This phenomenon of tense-marking is variously called vowel alternation, vowel gradation, apophony and ablaut - (so named by J. Grimm). In Dutch, I found the name klinkerverandering which needs no interpretation for those familiar with German.

Technical explanations

Since this paper investigates the iconic nature of vowel alternation in its role as a tense-marker, it does not include irregular verbs whose present tense stem vowel remains identical in the past (preterit) and the past participle (as in beat, lend, cut, put).

It does, however, include vowel-changing verbs which might not be regarded irregular because their suffixes are classified "regular", as the German verbs wiss-, (wußte, gewußt), dürf-, müss-, könn-, mög-, woll- + will- and the seven German verbs whose principal parts contain e, a, ä vocalic alternation as in kenn-, kannte, gekannt.

The first two pages contain tabulations of the German verbs and the next two pages contain tabulations of the English verbs.

The verbs are arranged in three columns on each page according to the phonological character of their preterit and past participle. The column headings (e.g. FRONT > BACK > BACK) show the phonological value of the stem vowels in their principal parts.

The letter "V" in the subheadings indicates the various present tense vowels listed under this letter "V." These present tense vowels are arranged in their sequence in the vowel triangle (e.g. i, ü, e). The two letters next to the letter "V" represent the stem vowels in the preterit and the past participle. They are also arranged according to their sequence in the vowel triangle.

The German verbs and their stem vowels, used in the subheadings are printed with graphemes of the German orthography, the English stem vowels with those of the IPA.

The verbs within each group are alphabetically arranged. English verbs whose vowel-changing past tense forms are in the process of evolutionary change are in parentheses (e.g. sneak) and so are lesser used preterit variants of English verbs, e.g. the sprung, preterit variant of spring).

Statistical data

These tabulations themselves might convey the impression that the general tendency, the dominant pattern of vocalic change is this: Present tense front vowels are replaced by back vowels in the past and the past participle or at least in one of them. But accurate statistical data prove unmistakably that vowel alternation is substantially more than a mere haphazard phonological occurrence.

Simplification

The tabulations included the verb groups where front vowels change to alternate front vowels (as in eat, ate, eaten) and back vowels to other back vowels (as in loose, lost, lost). In order to facilitate an overview of the statistical summary such verbs are not included in it, since they do not move the balance of vowel alternation in either direction. These verbs will be referred to as "neutral."

FRONT>BACK>BACKV U Ui
wiss-ü
dürf-
müss-V U Oe
werd-V A Ui
bind-
(ding-)
dring-
find-
geling-
kling-
mißling-
ring-
schling-
schwind-
schwing-
sing-
sink-
spring-
stink-
trink-
wind-
wring-
zwing-V O Oö
könn-
mög-
schwör-
(v)erlösch-FRONT>BACK>BACKV O Oie
bieg-
biet-
flieg-
flieh-
fließ-
frier-
genieß-
gieß-
kies-
kriech-
riech-
schieb-
schieß-
schließ-
sied-
sprieß-
stieb-
(trief-)
verdrieß-
verlier-
wieg-
zieh-i
glimm-
klimm-
e
beweg-
dresch-
fecht-
flecht-
heb-
melk-
pfleg-
quell-
scher-
schmelz-
schwell-
(web-)ä
gär-
wäg-ü
betrüg-
(kür-)
lüg-FRONT>BACK>BACKV A Oi
beginn-
gewinn-
rinn-
schwimm-
sinn-
spinn-e
berst-
brech-
gelt-
helf-
schelt-
schreck-
sprech-
stech-
sterb-
treff-
verberg-
verderb-
werb-
werf-eh
befehl-
empfehl
nehm-
stehl-
ä
gebär-V A Ai
bring-
e
brenn-
denk-
kenn-
nenn-
renn-
send-
wend-eh
steh-

FRONT>FRONT>BACKV I Aeh

geh-

ä

häng-

FRONT>BACK>FRONTV A Ei

bitt-

sitz-

ie

lieg-

e

ess-

fress-

geb-

genes-

gescheh-

les-

mess-

seh-

tret-

vergess-

ei

sei-

{BACK+}
{FRONT} >BACK>BACKV, V U Aa+ä

back-, bäck-

fahr-, fähr-

grab-, gräb-

lad-, läd-

schlag-, schläg-

trag-, träg-

wachs-, wächs-

wasch-, wäsch-

o oo+i
woll-, will-{BACK+}
{FRONT} >FRONT>BACKV, V I E Aa+ä

blas-, bläs-

brat-, brät-

fall-, fäll-

halt-, hält-

lass-, läß-

rat-, rät-

schlaf-, schläf-

V, V I Aa+ä

fang-, fäng-

V, V I E Oo+ö

stoß-, stöß-

FRONT>FRONT>FRONTV I Iei

angreif-

befleiß-

begreif-

beiß-

bleich-

gleich-

gleit-

greif-

kneif-

leid-

pfeif-

reiß-

schleich-

schleif-

schleiß-

schmeiß-

schneid-

schreit-

spleiß-

streich-

streit-

weich-

zerreiß-

FRONT>FRONT>FRONTV I E I Eei

betreib-

beweis-

bleib-

entscheid-

gedeih-

leih-

meid-

preis-

reib-

scheid-

schein-

schrei-

schreib-

schweig-

spei-

steig-

treib-

vermeid-

verzeih-

weis-

V I E I E Iei

heiß-

BACK>BACK>BACKV U Aa

schaff-

V O Oau

sauf-

(schnaub-)

saug-

V A Oo

bekomm-

komm-

V A Au

tu-

BACK>FRONT>BACKV, I E V, Iu

ruf-

au

hau-

lauf-

V, I V, Ia

hang-

FRONT>BACK>BACK	FRONT>BACK>BACK	{BACK}*>BACK>BACK {FRONT}
V /u/	V /a/ /a/	VV /u/ /o/
/ɪ/ will	/e/ beget	/ay/ fly
/æ/ can shall stand understand	forget get tread	
V /o/ /o/	V / / / /	VV /o/ /o/
/i/ (cleave) (heave) freeze reeve speak steal weave	sneak	/ay/ abide bide (dive) shine (smite)
/e/ awake break (stave) wake	/ɪ/ cling dig fling (shrink) (sing) (sink) sling spin (spring) stick sting (stink) string swing win ^o wring	VV /ɔ/ /ɔ/
/ɛ/ bear sell swear tell tear wear		/ay/ buy fight
V /ɔ/ /ɔ/		VV /ʌ/ /ʌ/
/i/ (beseech) seek teach		/ay/ strike
/ɪ/ bring think /æ/ catch		VV /aU/ /aU/
		/ay/ bind grind wind
	CENTER>BACK>BACK	
	V /ɔ/ /ɔ/	FRONT>{BACK* FRONT}
	/ə/ work, wrought, wrought	V /ay/ /e/ may

*The diphthong /ay/'s first component - namely /a/ - is a back vowel. Its second component is the glide /y/, the highest front semivowel.

FRONT>FRONT>BACK

V /æ// /

/ɪ/
begin
drink
ring
shrink
sing
sink
spring
stink
swim

V /ɛ//o/
/ɛ/
swell

V /ɪ//o/
/ɪ/
shear

FRONT>BACK>FRONT

V /u//e/
/e/
slay

V /u//e/
/e/
forsake
mistake
shake
take

V /ɔ//i/
/ɪ/
see

V /ʌ//ɪ/
/ɪ/
be

FRONT>CENTER>CENTER

V /ɑ//ə/
/ɪ/
hear

* The diphthong /ay/'s first component -namely /a/ - is a back vowel. Its second component is the glide /y/, the highest front semivowel.

BACK>BACK>BACK

/o//u//o/
blow
grow
know
throw

/ɔ//u//ɔ/
draw

/u//o//o/
choose

/u//ɔ//ɔ/
lose

/u//a//a/
shoot

FRONT>FRONT>FRONT

/ɪ//e//i/
eat

/ɪ//e//ɪ/
(bid)
(forbid)
give

/ɪ//æ//ɪ/
bid
forbid

/ɪ//e//e/
(bereave)
bleed
breed
creep
deal
(dream)
feed
feel
flee
keep
kneel
lead
(leap)
leave
mean
meet
read
sleep
speed
sweep
weep
/e//e//e/
say
/ɪ//æ//æ/
sit
(spit)

{BACK}>BACK>FRONT
{FRONT}

/ay//o//ɪ/
drive
ride
rise
smite
(shrive)
stride
thrive
write

/ay//ʌ//ɪ/
(strike)

BACK>FRONT>BACK

/u//ɪ//ʌ/
do

/o//e//ʌ/
go

/ɔ//e//ɔ/
befall
fall

/ʌ//e//ʌ/
become
come

/ʌ//æ//ʌ/
run

{BACK}>FRONT>FRONT
{FRONT}

/ay//ɪ//ɪ/
bite
hide
light
slide

/ay//e//e/
lie

BACK>FRONT>FRONT

/o//e//e/
hold

German verbs

A total of 195 German verbs are listed in the tabulations. Discounting the 53 which are in the neutral category (defined in the preceding paragraph) leaves 142. The first page of the tabulations shows that the present tense front vowels of 104 of these 142 change to back vowels in both past tense forms: 73.24%

The present tense front vowels of 16 change to back vowels in one of the past tense forms. The present tense back vowel + front vowel combination (/a,e/ as in lad-, läd-) of 9 have back vowels in both past tense forms and 9 (/a,e/ as in schlaf-, schläf-) have back vowels in one of the past tense forms. The total number of these verbs which show clear preference for changing from front vowels (or a combination of back and front vowels) to back vowels is 34 (16 + 9 + 9): 23.94%

Only 4 present tense back vowels (as in ruf-, rief-, gerufen-) change to front vowels and only in one of the past tense forms: 2.82%

English verbs

A total of 143 English verbs are listed in the tabulations. Discounting 38 of these which are in the neutral category (as defined in the second paragraph under the subheading Statistical data) leaves 105. The present tense front vowels of 50 (of these 105) change to back vowels in both past tense forms: 47.62%

One present tense central vowel and 12 present tense back vowel + high front semivowel diphthongs (/ay/ as in fly) change to back vowels in both past tense forms: 12.38%

From-front-to-back vowels tendency is also shown by 18 present tense front vowels which change to back vowels in one of the past tense forms. To these 18 might be added one more front vowel which changes to a central vowel in both past tense forms (/hir,hə-rd/): 18.10%

Hardly any clear direction of vocalic change is detectable in one verb's present tense front vowel (in may) which has only a preterit form (might). The same applies to 9 present tense back vowel + high front semivowel diphthongs (/ay/ as in rise) which change to back vowels in one past tense form and to front vowels in the other: 9.52%

A different picture is presented by 7 present tense back vowels. They change to front vowels in one of the two past tenses (as in: go, went, gone): 6.67%

There is more vocalic alternation in 5 present tense back vowel + high front semivowel diphthongs which switch to front vowels in both past tense forms (as in: bite, bit, bitten) and so does one present tense back vowel (in: hold, held, held): 5.71%

Dutch verbs

There seems to be no need to list the altogether 195 vowel-changing Dutch verbs, since the detailed listing of the German and the English verbs clearly indicates the iconic nature of vowel alternation. Discounting 52 neutral verbs (as defined in the second paragraph under the subheading, Statistical data) leaves 143.

The present tense front vowels in 77 (of these 143) change to back vowels in both past tense forms: 53.85%

The present tense central vowel + bilabial semivowel diphthongs (/əw/ as in bulg-) in 24 verbs change to back vowels in both past tense forms: 16.78%

The present tense front vowels of 42 change to back vowels in one of the past tenses: 29.37%

Dutch is consistent in having no verbs which defy the general direction of alternation from front vowels to back vowels.

Sound symbolism

It is obvious by any standard that the overwhelming preference for back vowels in the past tense forms cannot be attributed to blind chance.

A clear parallel can be drawn to spatial sound symbolism: a distant point is not here but over there (not /hɪr/ but /dɔrt/ in German, not /ɪtt/ but /ott/ in Hungarian, not /tæ:llæ/ but /tuolla/ in Finnish. The past also seems farther removed than the present. The articulatory movements of the tongue appear to mirror the implied differences in space and in time respectively: The front stage where the present action is and the background to which the past withdraws, are mirrored by front vowels and back vowels respectively.

I find Patrick Duffley's suggestion intriguing that the tongue appears to move from its resting frontal position through front vowel and central vowel stages when it withdraws to its back vowel positions, thus pointing to the direction of the past (1993). It has been argued, says Makkai (1993: 380) "that the human mouth can be viewed as a micro-universe in which sounds iconically represent events taking place in the outside world."

Based on acoustic impressions, German standard terms for front and back vowels are "helle Vokale" and "dunkle Vokale" (light vowels and dark vowels). The Hungarian terms are "magas hangok" and "mély hangok" (high sounds and deep sounds). These are concepts not far removed from similar acoustic concepts of high and low pitch.

Jakobson and Waugh also make more than one reference to light versus dark sound symbolism (1979: 185).

At the very beginning of my teaching German 101 each academic year (for three decades), I orally repeated all the German front vowels and back vowels several times and asked the students to determine which group of vowels sounded soprano and which bass. All respondents were in agreement that front vowels are soprano and back vowels are base.

I devised the following experiments for American respondents to test their subconscious notions concerning the past:

(1) Using two grey posters of identical size and shape, one was placed on the wall in front of the respondents and one on the wall behind them. The respondents were told that one of the posters represented the present and the other the past: 94% of them chose the poster on the back wall as representing the past.

(2) Using the same two posters and giving the same instructions, both posters appeared on the wall in front of the respondents: one on the chalkboard and the other beneath it, touching the floor. Eighty percent of the respondents opted for the lower poster as symbolic of the past.

(3) Two posters of equal size but differing in shade of grey were placed next to one another on the chalkboard facing the respondents. The dark grey poster was chosen by 72% of the respondents to symbolize the past.

This experimental evidence helps to show how generally shared these synesthetic feelings and metaphoric transfers are.

Such English expressions as "a few years back," or "let's go back further in the past" are indicative of our subconscious images. A generally shared synesthetic-metaphoric feeling appears to be inherent in our thinking. The past is perceived as something left behind on the lower end of an ascending time line. In the image of many it is covered by haze or darkness.

It is understandable therefore that in the course of the subconscious process of linguistic evolution "dark" and "deep" vowels were chosen by one group of humankind to represent the past that has submerged behind us.

The question whether the articulatory motions of the tongue or the acoustic values of the vowel sounds comprise the determinant factor appears to have been adequately answered already a hundred years ago by Wundt: "...an intimate relationship exists between the concept and the sound as well as the sensation of motion which is generated by its

production" (1983: 613).

It appears to be relevant to quote from a recently presented paper to add to all of what has been said so far, : "...verb reduplication in Chinese is completely iconic if it is viewed from the dimension of the concept of time" (Zhou 1993: 2).

Malkiel arrived at a similar conclusion in assessing the iconic nature of partial reduplication of the first syllable of a class of classical Latin verbs. He concluded: "...we are privileged to watch a symbolic process, ... set in motion to obtain a neatly circumscribed morphological end, namely the derivation of a past tense ... By stretching or straining our imagination, we could speculate that within the frame of certain archaic or exotic cultures the present figured as a dot or a short stretch and the past as an accumulation of such stretches, with a hint of plurality..." (1978: 519).

Significance

The significance of these findings can hardly be overestimated.

(1) The phenomenon of vowel alternation as an iconic marker of the past tense goes beyond the realm of free morphemes where research has found most occurrences of iconicity.

(2) There is not merely synesthesia with physical intersensorial images at work but metaphoric transfer from the concrete spatial area into the abstract domain of time is also involved.

(3) Speaking of apophony, Jespersen noted that Jakob Grimm 'was fascinated by the commutation of the vowels ... In that class of verbs which [he] called 'strong' he sees ... something ... admirable...' (1922/1964: 46). Yet it has taken 174 years from the publication of Grimm's *Deutsche Grammatik* in 1819 for the preterit and past participle ablaut in Germanic verbs to be discussed in linguistic literature as a prime example of sound symbolism. This is probably indicative of how much can yet be recognized as iconic.

These findings have added to the weight of evidence of:

(1) iconic findings mentioned earlier;

(2) the numerous theoretical and largely anecdotal, yet insightful treatises in favor of sound symbolism which had already been published by Saussure's time but were apparently too lightly dismissed by him;

(3) the gradually accumulating literature on iconicity that has been published since Saussure's time.

All of these have led me to the recognition that there is substantial difference between the nature of the ongoing existence of the linguistic sign and its actual functioning on one hand, and the nature of its ultimate genesis on the other hand. I think that only an unequivocal separation of the study of these two distinct phases in the life of the linguistic sign can lead to a definitive solution to the contradiction inherent in the pan-arbitrariness doctrine.

The arbitrariness of the linguistic sign seems to be overwhelmingly limited to conventional signs, i.e. received signs, in other words signs already in existence and to the conscious creation of the sign which is governed by volition. It does not necessarily include the sign's subconscious genesis.

The phoneme sequences chosen in the process of the natural (= intuitive) genesis of linguistic signs may be subconsciously influenced, inspired, indeed guided, by what Dwight Bolinger called "... the underlying iconic drive to make sound conform to sense" (1968/75: 218).

Amendment

I propose to amend the Saussurian Principle I as follows:

The linguistic sign conventionalized by general use is arbitrary and so is the conscious creation of the sign.

However, the subconscious genesis of the linguistic sign is iconic in many functions, in many - if not all - languages.

General acceptance of the pan-arbitrariness principle is probably responsible for having impeded, if not stopped, many an inquisitive researcher in advancing in the direction of sound symbolism as a source of the sign's genesis.

Had this principle not been prematurely adopted and elevated to a quasi-dogma which truly "dominates all the linguistics of language," - as Saussure put it (1959: 68) - far more could have been discovered about the - perhaps substantive - role of iconicity in many - if not all - languages.

It is difficult to take on the role of an iconoclast. It is hard indeed to think, let alone say, that the emperor has no clothes... when it seems that all around - and above - you persistently and convincingly praise his new clothes...

Although the findings of my independent empirical research consistently contradicted Principle I, I tenaciously tried to find a compromise with the tenet of pan-arbitrariness. But my efforts failed continually.

John Dewey's belief that "... any theory .. is dogmatic which is not based upon critical examination of its own underlying principles," (1938:22) has sustained me throughout decades of iconic research.

In place of an impossible compromise I offer a substantial amendment which makes a necessary distinction between the nature of the sign's ultimate, unconscious genesis and the nature of its resulting product.

Making such a distinction is supported by the gradually accumulating empirical findings of those of us who have questioned the Saussurian law.

Actually it appears to be supported by fundamental facts of the universe where both the nature of the genesis of natural phenomena and the nature of the creation of intellectual activities appear to be usually different from the nature of their products...

If linguists revise their thinking to include the suggested amendment to Saussure's all-important Principle I, a window will be opened by and for them. Roman Jakobson's vision (concerning distinctive features) seems to be applicable here: "... the window thrown open means a cleared way to a venturesome contemplation of the inner laws... and any further inquiry promises an even deeper insight..." (1979:121).

A new additional direction of research is likely to develop. Insightful iconic findings are bound to stimulate new inquiries in the related fields of psychology and anthropology with far-reaching consequences.

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THE LAST STAGES OF THE ACQUISITION OF SYNTAX: THE INTERACTION OF READING AND SYNTACTIC DEVELOPMENT

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Introduction

A great deal more attention has been paid to the early stages of the acquisition of syntax than to the later stages. What has been found so far in studies of late acquisition may not be useful. As an example, even a book that is designed to analyze syntactic maturity (Hunt 1970) has as a high level example the sentence "Aluminum is an abundant metal with many uses." If we compare this suggestion of maturity with a Nathaniel Hawthorne sentence that has fifteen clauses, negative conditionals, a set of three prepositionally-based relative clauses, and a few appositives, we might conclude that there is much work to do on the later stages of syntactic acquisition. Unfortunately, some of the relatively small amount of research on the topic uses an analysis which may be characterized as a count of the number of clauses in a sentence. (See Brown 1973; Bloom 1980; Kessel 1970) The development of multi-clausal sentences does correlate with syntactic maturity to a degree, but the more important data are the types of syntactic constructions developed and the complexity of the clauses in the multi-clausal sentence. Four and five year old children can play various word games in which almost every noun adds a relative clause. The complexity level of a five year old child's ability in the game "This is the house that Jack built" may be judged, for example, as an eight- or nine-clause sentence.

This is the house that Jack built.

This is the straw that lay in the house that Jack built.

This is the mouse that lived in the straw that... [and so on]

However, the syntactic complexity in terms of syntactic constructions involved is only that of the subject-based relative clauses in the structure. The field of language acquisition and development has advanced enough so that we should be making more accurate observations of the general sequence of the acquisition of the more complex constructions and of the multi-clause sentences that use more and more of the complex constructions learned later in the sequence.

There are at least three reasons why the research deals primarily with the early stages of syntactic acquisition. The first reason relates to earlier studies of languages in which syntax was said to be acquired early. A few decades ago, some of the basic linguistic books suggested that all the basics of syntax were established by age 7. Scott (Nippold 1988:49) traces the lack of attention to the later stages of syntactic acquisition to such statements as McNeill's 1966 observation that children by the age of four are producing sentences of "every

conceivable syntactic type." (p. 99) If the categories are broad enough, this statement is true. Research as noted below suggests that such statements are insufficiently rigorous for an accurate assessment of syntactic development. Another earlier hypothesis that had an impact was that the primary parts of language could no longer be acquired with ease after puberty (Lenneberg 1967). Of course neither of the two scholars cited suggested that no study of the late stages should be done. (See C. Chomsky 1969; Nippold 1988) The second reason for concentration on the beginning stages is that the authors often seem more interested in the linguistic theory and/or notation than in the language acquisition process. The third reason is that it is much easier to study the early stages because — among other reasons — the speech environment of the child can be controlled and a high percentage of the child's output can be recorded and observed. The difficulty of studying these later stages and the continuing development of linguistic theory and notation are not sufficient reasons to avoid the study of the later stages of syntactic acquisition.

This paper treats the general process of the child acquiring the language structures in their environment. Next the paper presents an example of an area of syntax the beginning stages of which are learned early and the later stages of which are learned late — if they are learned at all. A few other constructions learned late in the sequence are included. The next section then presents some examples of the complex reading material we expect our junior high school and high school students to handle. These examples are presented together with some examples of the complexity of syntax in the reading texts designed to teach them the more complex types of language. Some suggestions for future research close the paper.

Acquisition of Syntax

Children acquire the language(s) in their early environment. Their level of competence in each language partly depends on the level of language to which they are exposed. Simple vocabulary and simple sentence patterns in the environment mean that the child cannot develop past that simple level. Children learn that which is about them when they are at a stage of readiness for it. If no complexities occur, they do not learn them. This elementary point can be seen by an investigation of the language of the home, the peer group, the TV shows watched, and so on. In some of the observations, the speech in the child's environment remains at the four to five year old level in terms of syntax, including most of the children's TV shows.

For many children the books encountered at school are the only places where the intermediate difficulty syntax and the complex syntax occur. Usually it is about the fourth grade (see, e.g., Nippold 1988: p. 3) that the child has developed the reading skill sufficiently to be reading at the level of complexity of the child's syntactic competence. For the child who started syntax at age 1.5 years and began school at age 6.5 years, there was five years of development of spoken syntax before learning to recognize the same constructions on paper. If Lenneberg's synthesis of hundreds of studies is reasonably accurate, the child should be encountering the intermediate difficulty syntactic constructions in the third or fourth grade. The difficult levels of syntax should then be

included in the school materials for the fifth, sixth and seventh grades. The combinations of syntactic constructions can then be developed in high school and later. This sequence was the one used in the last century in some school readers, some of which are now being used in the growing home schooling programs. (For types of constructions included in syntactic development, see Bolkenstein, *et al.* 1981, Cowper 1992, Jespersen 1937, Napoli 1993, Stockwell 1973)

Examples of Late Syntactic Acquisition

One example of an area of syntax that has been studied in detail is that of the various types of relative clauses. The subject-based one is within the competence of the ordinary four year old, while the prepositionally-based one is often not found in the child's speech until high school — if it is found at all. It should not be difficult to include the following type of example in the fifth and sixth grade books, yet whole junior and high school series have been used in which no sentence reaches this level of complexity :

Yes, that's the room in which the baby sleeps.

In a fairly recent book on later language development (Nippold 1988), all types of relative clauses were treated (Scott 1988) as of equal complexity. Yet, relative clauses are actually a good example of the increasing difficulty of syntactic constructions. (See Prideaux and Baker 1989) The child is usually using a version of the subject-based relative clause by age four, yet the most complex one may not be acquired at all.

Subject-based Relative Clauses

The man left. + The man is wearing a black hat.

(Subject)

The man wearing a black hat left. (Reduced version)

The man that is wearing a black hat left.

The man who is wearing a black hat left.

The Subject construction is learned early, usually by age four or five, although the way of using the reduced form or "that/who" vary in development.

One version of the Object-based relative clause is learned during or just after the time the Subject-based one is learned.

Object-based Relative Clauses

The picture fell. + Steve painted the picture.

(Object)

The picture Steve painted fell. (Reduced version)

The picture that Steve painted fell.

The picture which Steve painted fell.

There is a frequently occurring variation of this construction which is learned in its full form later — and may not be learned at all except as a memorized grammar rule. The appropriate use of "whom" is reinforced by school exercises since a relatively small percentage of students learn

the grammatical usage. A related late development, not treated here, is the grammatical constructions using "whoever" and "whomever."

The man arrived. + Steve already knew the man.

The man Steve already knew arrived. (Reduced version)

The man that Steve already knew arrived.

The man who Steve already knew arrived.*

The man whom Steve already knew arrived.

The next type is much less frequent in the secondary school environment than the last two.

Genitive-based Relative Clauses

The man left yesterday. + The man's hat was green.

The man whose hat was green left yesterday.

Style books often frown on this construction and ask the students to avoid it in production. In the reading of earlier prose, the construction is not rare. An investigation of over 1000 freshman college student papers found no examples of this construction. An output-based study might conclude the students do not have the construction. All students of the 1000+ in a follow-up did indeed control the construction. In terms of encountering the construction in school reading, the whose construction is usually not encountered until the junior year literature course and even then only in a few of the school textbook series.

As with the last construction, the Preposition-based relative clause is rarely found in the secondary school environment.

Preposition-based Relative Clause

The room was dark. + The baby slept in the room.

- a. The room the baby slept in was dark. (Reduced)
- b. The room that/which the baby slept in was dark.
- c. The room in which the baby slept in was dark. *
- d. The room in which the baby slept was dark.

* The "*" indicates that the sentence is not well-formed. This construction with two occurrences of the same preposition is almost always in spoken language only. Incomplete learning of the structure leaves the preposition in its original place and uses it also before the relative pronoun. Tiredness, medication and so on may give a performance level at c* even though the underlying competence is at d.

As with the whose construction, the prepositionally-based relative clause is rarely found in the production of late teens.

There are various complications in the more difficult relative clause constructions. Here one example is given of a complex construction.

Complex Relative Clauses

The problem was on page 47. + According to the terms of the problem, we were to do X...

The problem, according to the terms of which we were to do X ..., was on page 47.

In this construction, the extra material between the noun and relative markers, such as "according to the terms," can be quite long and syntactically complex itself. The construction of the properly formed relative clause is more difficult because of the added syntactic material. The learner must have the first four types of relative clause constructions under control before the various types of complex constructions can be controlled. While some studies (Scott 1988: p. 72) of relative clauses suggest that all types are learned together, a few observation sessions will show that the progression is similar to that suggested above.

Note that we are here discussing the learning of these constructions as a regular part of language acquisition rather than through the schooling process of memorizing the usage rules. The more complex types can be learned in a problem-solving or cognitive way. A person can memorize the appropriate grammatical rules and edit production in writing or reading, but here the question is discussing the acquisition of such a complex construction as a basic part of the person's linguistic competence.

This material is used in a senior level course at a university and approximately 50% of the students have difficulty even with clear examples such as that given here. Actually occurring examples, such as those taken from William F. Buckley's newspaper column or his TV show, "The Firing Line," cause even more difficulty as some students have to re-read and analyze the sentence. Some students — occasionally 10% of the class — never do understand the content of the sentence. Yet, those students who had the construction within their language competence before the class have difficulty understanding why the others find the construction all that difficult.

This last point is an important one in language acquisition. Those who have the syntactic competence to handle even the more complex relative clauses occasionally evaluate the others as of lesser intelligence. While it is true any one person may not be as intelligent as another, it also is the case that a person's full intellectual capacities may not be completely realized with a defective syntactic competence. Here the line between cognitive abilities and linguistic abilities may be rather narrow. The child who is exposed to the various types of complex relatives during and after the middle school years rarely seems to have trouble with the construction. As with phonology and morphology and basic syntax, the higher levels will ordinarily be learned if the child is exposed to them at the right stages of development.

In addition to complex relative clauses, there are other syntactic constructions which appear late — if at all. One is part of the negative conditional construction, such as

If he would not have come, I would have had to try again.

A variation involves a late lexical item.

Lest he be misunderstood, he declined to comment.

This last example could be stated as

So that he would not be misunderstood, he declined to comment.

Note here that the "lest" sentence is related to the subjunctive construction in English. Consider the following three sentences.

If that was true, he was guilty.

Here the sentence is a simple conditional. The situation that existed in the past can be investigated for the truth value.

If that were true, I would agree with you.

Here the "were" occurring with the singular subject "that" indicates a subjunctive or contrary-to-fact clause. The speaker is indicating that the "that" is not or probably is not true.

If this be true, I will agree with you.

Here the matter may or may not be true and the speaker indicates that the truth value will be investigated.

As with the more difficult types of relative clauses, no example of the last two constructions was found in over 1000 papers produced by college freshmen. As with the complex relative clause, class discussions of these two constructions cause difficulty for 5-10% of the class members. At Trinity University, the average SAT is over 1200, so that the students are not deficient in cognitive skills. Here it is the complexity of the linguistic constructions that seems to cause the difficulty.

In the investigation of the occurrence of constructions and their error rates, this paper is following such scholars as Lee (1974) who was applying to syntax some of the ideas of Jakobson (1968) on language development. Errors in a use of a syntactic construction may tell us the ones that the child is learning. For adults, the errors may signal incomplete learning or the errors may be the result of an illness or of medication. The syntactic constructions learned last or those under least control are those usually affected by minimal illness or medication.

The full treatment of intermediate and late syntactic development remains to be done. One source of material to study is the prose of the 18th and 19th centuries, including the prose of the major documents of our history, such as the the Federalist Papers, Lincoln's addresses, and so on. The next section picks out a few examples of some complex sentences found in these documents.

Syntactic Complexity in High School Texts

This section includes a few examples of reading selections that are used in various high school programs. Honors courses in high school are designed to prepare the student for high level college work. The first selection is from an honors English class and has a complexity level more appropriate to the middle years of elementary school. The second and third are from the Declaration of Independence and the Constitution, two documents which we expect our high school graduates to have read.

The first example of syntactic complexity in prose selections used in some high schools is from a study of high school honors English texts. (Leal and Maya 1992) The following selection is the most complex one found toward the end of one such text:

A natural athlete, Alexander became a swift runner, an agile fencer, an accomplished archer, and a fearless hunter. He also exhibited an uncanny ability as a horseman. Alexander's prowess emerged when, as a young boy, he tamed a horse that reared, thrashed its hooves, and shied away from everyone. Alexander watched the horse and noticed that it was afraid of its own shadow. Soothing the spirited animal, Alexander turned it to face the sun and quickly mounted the horse, called Bucephalus (byoo SEF uh luhs).

The underlinings indicate the syntactic constructions other than the main clause. The average number of clauses — including the main clause — per sentence in the text is 1.35, which is about 2nd or 3rd grade level in complexity based on quantity. The types of syntactic constructions in this selection consist of subject- and object-based relative clauses, a simple appositive, a time clause. Far from suggesting a senior honors literature class, the selection is at the complexity level of the third McGuffey Reader of the 19th century. In many of the paragraphs throughout the book, there are only a few easy relative clauses found other than the basic sentences themselves. Note that the content of the material is not sufficiently difficult to suggest the use of easier syntax to make the overall reading problem easier.

This honors English text is indeed at a higher level of syntax and vocabulary from the regular English text used in the same high school. Although in the past 10-15 years there have been more school texts which include sections of the more developed syntactic complexity, most still remain at an elementary school level. Those texts which include several selections from the major authors of the 19th century provide the students with examples of the syntactic constructions needed for full development. The vocabulary level of Hawthorne's *The Scarlet Letter* is high enough that the student who knows all the lexical items will do well on the SAT examination. The syntactic constructions and the combinations of the different types of constructions are good training in developing competence in syntax. There are examples in which Hawthorne uses 14 clauses, some of which are prepositionally-based relative clauses or complex relative clauses, conditionals, clauses within clauses within other clauses. Even where the learning of new syntactic constructions by the child has ceased, there is still much learning of

the combinations of those constructions to learn. Prose such as Hawthorne's is appropriate for such development.

The disparity between the syntactic level in the high school readers and that of the major documents of American history is rather great. The first sentence of the Declaration of Independence has over 20 clauses, including clauses within clauses, a prepositionally based relative clause and so on.

We hold these Truths to be self-evident, that all Men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the Pursuit of Happiness — That to secure these Rights... by abolishing the Forms to which they are accustomed.

Some sentences in the Constitution also have several clauses, clauses within clauses, two "if" clauses, prepositionally-based relative clauses and so on. A typical example is given here.

If after such reconsideration two-thirds of that house shall agree to pass the bill, it shall be sent, together with the objections, to the other house, by which it shall likewise be reconsidered, and if approved by two-thirds of that house, it shall become a law.
(1.7)

As noted above, sentences from the 19th century prose masters such as Hawthorne and Poe can reach to similar numbers of clauses and complexities. This level of syntactic complexity might be compared to some of the history and geography and so on texts used in many current high schools. Leal and Maya (1992) report on whole texts which — after eliminating subject-based relative clauses as non-complexities for high school readers — the average number of clauses per sentence in the text is about 1.1. While we want our younger generation to be able to read the basic documents of our culture, to read a job description upon graduation, to read warranties/guarantees, and so on, unless they are reading widely outside school, there is little to be optimistic about in their syntactic development in the school curriculum.

Conclusion

In syntactic development as in phonological development, children learn the language structures in their environment. In the special case of syntax, many children do not encounter all the intermediate and advanced syntactic constructions. The junior high school and high school textbooks, which could be the only contact they have with these constructions, have all too often been "written down" in complexity of language and content. It is not surprising that high school valedictorians have sued their high schools when they discovered that their reading level was not much better than barely literate. As linguists, we ought to be doing more and better research on the late stages of syntactic acquisition and development. Our research will then complement the other types of research that go into quality textbook construction.

Research on the late stages of the acquisition of syntax will require several more years for precise statements of the process. In terms of the application of what we have known, the texts of a century ago had a slow progression from basic syntactic patterns in the primer through 19th century prose examples by the 6th reader. The reading textbooks of one hundred years ago contained passages of much higher complexity than the sentences analyzed in, for example, the recent Napoli book (Napoli 1993). In terms of careful research projects, over the past few decades of linguistic work, the amount of attention paid to the child's development of syntax from beginning to end seems to be inversely proportional to the complexity of syntactic constructions. That proportion should change.

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APPLICATION OF DISCOURSE MODEL IN
DEVELOPING COMMUNICATIVE COMPETENCE

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The present study seeks solutions to problems related to the acquisition of the following aspects of communicative competence in foreign language education:

I. ORAL ABILITY (Speaking)

1. Fluency

1.1 Ability to produce stimulus and response utterances in accordance with topic, situation, and speaker's communicative intention.

1.2 Ability to use vocabulary, grammar, and semantic links appropriately.

2. Accuracy

2.1 Ability to produce grammatically correct forms.

II. ORAL ABILITY (Listening)

1. Fluency

1.1 Ability to recognize and understand stimulus and response utterances in accordance with topic, situation, and speaker's communicative intention.

1.2 Ability to understand utterances in context.

2. Accuracy

2.1 Ability to understand grammatically correct forms.

It is based on an experiment with ninety-six ESL ninthgraders divided into one control and three experimental groups, and conducted over one school year. It involves an entrance proficiency test of above skills, formative instruction with group activities, and final proficiency test of the same communicative skills.

The initial test was held at the beginning of the school year. It consisted in the written completion of two texts, a dialogue and a narrative. The students' task in the first case was, working in pairs, to fill in the part of one of the interlocutors. The completion of the narrative was done individually. The first test item revealed the initial level of the

students' fluency, the second one registered the students' level of accuracy.

The final test was held towards the end of the school year. Assignments were similar to those from the initial test and involved the group completion of a dialogue and the individual completion of a narrative.

Between the two tests the three experimental groups had specially designed group activities added to their ESL instruction, whereas the students from the control group followed the regular curriculum for this grade. The group activities offered to the students from the experimental groups were designed after a working discourse model based on research by Sinclair and Coulthard (1975), Sacks (1972), Austin (1962), Searle (1969), and incorporates the following components:

CATEGORIES OF MEANING	CATEGORIES OF DISCOURSE
Orientation	Language Exchange/ Speech Event
Organization	Chain Sequence introductory main supplementary conclusive
Appropriateness	Adjacent Pair uninterrupted (U1 + U2) interrupted [U1+{Us1+Us2}+U2]
Choice	Utterance Speech Act

In the above model the smallest unit of discourse is the speech act meaning "what the speaker does, using the language, e.g. apologizes, threatens, asks" (Finocchiaro and Brumfit, 1983). It is also assumed that the speech act is not in any direct correspondence with any known units of language (Hymes, 1972). The term utterance is defined to include everything said between the initial and final pause, marking the beginning and the end of one's turn in a conversation (Finocchiaro and Brumfit, 1983).

The adjacent pair is next in rank. It consists of two utterances, a stimulus and a response. If the response follows the stimulus directly, this is a case of an uninterrupted adjacent pair. All remaining

combinations of utterances have been considered interrupted, with various number of side utterances inserted in between.

The sum total of all adjacent pairs in a piece of discourse has been defined as a chain sequence (Sinclair and Coulthard, 1975). The latter can be initial, main, supplementary, or conclusive, depending on the topic of the utterances included in it.

Language exchange is the top, or most general level of discourse, and is also known as speech event. It comprises everything said from the beginning to the end of a conversation.

The working model adopted in this study reflects only the most general aspects of the discourse structure, and is by no means detailed, or exhaustive. It was designed to be this way with a view to its application in this study, e.g. as a theoretical background for the analysis of classroom dialogues.

The units of discourse are defined in conjunction with the units of meaning, the most general category being orientation, expressed by the tendency of the interlocutors to converge, or diverge in a conversation, by their preference of this or that manner of expression. Orientation is realized by choosing specific language items to express one's communicative intention. The material manifestation of orientation is thus, of lexicoreferential character. For example, the frequent repetition of the preceding utterance, the use of synonymous expressions, is viewed as an attempt at converging with the other interlocutor. The use of elliptical, or one-word responses, on the other hand, is indicative of acceptance of the superiority of the other person. The use of unexpected side utterance instead of a direct response is a clear case of divergence, or an attempt to hold one's own in a conversation (Sinclair and Coulthard, 1975).

Organization is the next level in the structure of the categories of meaning. It represents the network of linguistic choices through which the participants in a conversation signal their orientation and what they view as its desired course. Statements like "Let's begin with ...", or "I conclude by ..." indicate that one of the participants has been granted the right to determine the boundaries of the conversation. The ranking of the participants in a conversation is revealed in the way in which they develop, contract, or monitor the amount of discourse. For example, the use of rising intonation tends to include others in the conversation, thus, causing it to expand beyond its expected limits. The choice of a neutral intonation expresses no particular desire to change the boundaries

of the conversation, whereas the use of falling intonation signals the end of the conversation although some of the participants may wish to go on.

After orientation comes appropriateness, or the ways in which subsequent discourse units are interrelated. Here every utterance from a chain sequence creates a frame determining the response options following it. For example, a question utterance could elicit the following responses:

- A brief, and completely appropriate response;
- An answer which responds to the meaning expressed by the question, but has a different structure;
- An answer, which is appropriate, responds to and expands the notional presuppositions of the question;
- A response which challenges the appropriateness of the question, as well as its answerability.

There are other possibilities as well. The respondent may not have heard the question, and may request the question to be repeated, or if the latter hasn't been understood altogether, the whole discussion may fall through.

The next category in rank, choice, or freedom of choice, refers to the options available to the interlocutors at every moment during the conversation. At this point their decisions are determined by the choices they made at the previous levels. Despite this, there are still quite a few possibilities for expression, often referred to as the "illocutionary force" of speech, a quality pertinent to every utterance (Austin, 1962; Searle, 1969).

The correspondence between the categories of meaning and these of discourse, comprising the above discourse model, is manifested both horizontally and vertically. Horizontally, the interdependence between the lower-end pairs of categories is much stronger since most discourse units at this end are formed according to similar rules. At the upper levels there is a far greater variety of rules for the formation of discourse, as well as kinds of discourse not immediately retrievable from available rules. Vertically, from top to bottom, the interdependence between the categories at the lower end of the scale is again stronger, for the same reasons mentioned above.

The application of the above discourse model in foreign language education was facilitated by techniques introduced by the functional-notional approach in ESL (Wilkins, 1973, 1974, 1977; Finocchiaro and Brumfit, 1983). They are all united by the same goal, the development of communicative competence, which they pursue in the creation of various kinds of

communication activities, set in a certain situational frame and completed as a result of goal-oriented oral interaction.

For the purposes of this study dialogues were created to include not only uninterrupted adjacent pairs, but various kinds of interrupted ones as well. Such variety of responses is seldom present in ESL materials. The range of choices at all levels, discussed above was fully explored, introducing both convergent, and divergent attitudes, and appropriate ways of expressing these.

The results of this experiment revealed that at the beginning of the school year in many cases the students made errors at all levels of meaning and discourse. Particularly striking were mistakes related to inability to grasp referential meanings across chain sequences, differentiate marked and neutral orientations, respond to and participate in interrupted adjacent pairs, differentiate between kinds of adjacent pairs. A universal tendency was revealed to treat every stimulus and response pair as an uninterrupted adjacent pair, bearing no connection to any other parts of the discourse.

Here are some typical examples:

- Inappropriateness

A: I'll ask someone to take your case to your room, shall I?

B: *Will you wake me up at seven tomorrow?

- Inability to grasp the nature of the chain sequence, or deal with broader contexts

A: ...I'll ask someone to take your case to your room, shall I?

B: *When should I pay the bill?

A: Do all the rooms have a bath?

B: Yes, all the rooms have a bath.

A: *How much does it cost?

The final test showed a considerable improvement in the students' communication abilities, namely, the part of communicative competence referred to in this study as fluency. It was accompanied by a survey of the students' opinions concerning their participation in group work which manifested a positive attitude and high esteem of the experimental instruction.

The following conclusions were drawn from this experiment:

1. There is a statistically valid difference

between the level of the two main components of the students' communicative competence, expressed in a relatively higher linguistic competence, e.g. higher accuracy, and lower fluency;

2. The above difference cannot be directly observed in the classroom, because due to the higher accuracy, the general level of communicative competence remains relatively high;

3. The use of group activities in TESL promotes fluency, by enhancing the students' ability to realize their communicative intentions, as well as their knowledge of discourse formulae and structures;

4. The use of group activities in TESL does not promote linguistic competence, or accuracy, and are not, therefore, an appropriate means to enrich the students' knowledge of the language;

5. The use of the specially designed expert system of group activities in TESL leads to the leveling of the two components of communicative competence, accuracy and fluency, by raising fluency to the level of accuracy;

6. The use of a working discourse model yields positive results in the creation of group activities promoting fluency. Further improvements may result from the use of a more specified discourse model;

7. The use of group activities in TESL promotes motivation in the sense that the students enjoy such activities, believe that they are useful, and would like to have them on a regular basis.

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A COMPARISON OF THE WRITING STYLES OF NATIVE AND NON-NATIVE SPEAKERS OF ENGLISH

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1. Rationale

Traditional analysis of ESL writing has often focussed on the lexico-grammatical level, paying particular attention to word usage and grammatical structure, but the center of language, of course, is semantic. If the critical role of language is the building of meaning, then our concerns about how language is composed cannot dissociate any aspect of language from meaning. There has been a tendency in much of the Western intellectual tradition, in fact, to separate language from experience, to view it as an isolated phenomenon that can be studied in and of itself without regard to the context within which or the purposes for which that language was produced. We may be able to parse isolated sentences or analyze grammatical rules, but true insights into the composing strategies of ESL writers (indeed any writers) can be gained only by an analysis of how these writers use the semantic resources at their disposal.

2. The Texts

When any composer writes, s/he must attend not only to the text itself, but also to the context within which it is written. A writer must recognize and work within the parameters of a particular genre and register, attending to the background, needs and expectations of her/his audience. The texts that are analyzed here were written by two students within the narrow confines of academic prose. Both authors were in the same Freshman Composition class at a small liberal arts college; thus both texts were produced under virtually identical external conditions, the only variation in context being that produced by the author him/herself.

The texts are the result of an assignment where the students attended a public lecture by a well-known expert on Black English. They then discussed the lecture in class, analyzing both its content and delivery. After peer discussion, and journal entry reflection, they wrote essays in which they were to summarize and evaluate the lecture. Thus, these are texts that are consciously and carefully planned,

executed, and polished; they have gone through multiple drafts and been critiqued by both peers and the professor. These are not spontaneous texts but have been crafted in response to a specific assignment and in the context of academic discourse and rigor. As a result, each text represents the author's best production of the register as s/he conceives it.

Only two texts will be analyzed, one written by a non-native speaker of English, the other by a native speaker. Text 1 was written by Chang, an ethnic Chinese-speaker from Malaysia, who came to Michigan in his early teens and attended the local public high school. Text 2 was written by Jenni, a native of Michigan whose language background is limited to English.

These texts were chosen for analysis because they are successful texts. It is my purpose here in this initial exploration of the English writing of non-native speakers to gain a better understanding of their writing at its deep semantic base and how that base might be different from that of native English speakers. If basic underlying modes of construction can be pinpointed, we can gain greater insight into both what makes for native fluency and how we can best work with all student writers. We have long known that simply attending to "surface errors" and lexico-grammatical constructions makes only a dent in helping students to produce interesting and meaningful texts that are easily accessible to a target audience.

3. Halliday's Textual Function

One of the most complex tasks ESL writers face is that of producing a cohesive piece of writing. This involves the manipulation of all those often subtle structures that make composition readable as a coherent whole. M.A.K. Halliday calls this the textual function. In its textual function, language "makes links with itself and with the situation" (Halliday 1971:334). This component provides a pattern for production, whereby the encoder organizes meaning as text. The textual function is internal to language, enabling it to meet the demands for comprehensive output. The structures that realize the options in the textual component are, in Hallidayan terms, thematic in nature. They give prominence to a message by emphasizing certain elements of that message and connecting what is said with what came before and with what comes after, and with the entire context of the message.

It is in this very area that the ESL writer is at a real disadvantage as s/he must use the foreign medium as a link to itself, a demanding metalinguistic task.

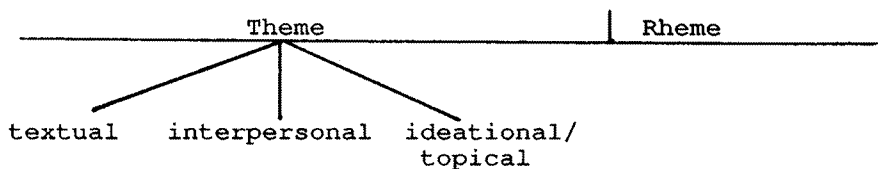
Here the non-native user can seldom rely on translation; as a result, his/her writing is often left ungrounded. This is nebulous territory where competence is largely a matter of feel. What makes a story, a story; an analysis, an analysis; an exposition, an exposition varies from language to language. The non-native speaker may not have these English macro-structures in place.

4. Theme

Because mastery of textual devices is necessary for the successful organization of meaning as text, this is the very component where native and non-native writing may diverge. In the analysis of these two texts, I looked at a number of features in the textual function. One was thematic structure.

The Hallidayan view of thematic structure derives from the Prague School notions of Theme and Rheme and is one of focus on Theme and its role as an organizer of the message. In English, Theme is signalled by putting it first. Every clause has an ideational Theme, a constituent that realizes meaning in terms of 'content'. Halliday calls this the topical theme. If there are interpersonal or textual elements that precede the topical theme, then the clause has a multiple theme (Halliday 1985:53). Thus any material up to the first ideational element is Theme; whatever follows the first ideational element is Rheme.

Figure 1: Thematic structure



It is the choice of Theme that moves the text forward, developing, clause by clause, the sense of the piece of writing as a cohesive message. English, as any language, has its particular patterning expectations, and these vary from genre to genre, register to register. In a narrative, or an exposition, the same participant typically remains as topical (ideational) Theme for stretches of text, producing a sameness of lexicoreferentiality (Halliday 1985:315). In logical argumentation, thematic patterning is more zigzag (Daneš 1974:118-119), with the Theme of one clause being selected from the Rheme of the preceding clause (Halliday 1985:315).

It is in this very area that the two texts differ remarkably. Jenni's text [see Appendix, Text 2, for the beginning section of that text] follows the normal expected patterning in English for logical argumentation. All six major thematic notions (Smitherman, the speech, culture, communication, ego, audience) are introduced into the text, one-by-one, first as rhematic material or in some indirect fashion. The major participant, Smitherman, is not introduced into the text until Sentence 3, by which time all of the other thematic notions have been introduced with the exception of that of communication. Thus Jenni carefully leads the reader into the world of her essay.

Chang's text [see Appendix, Text 1, for the beginning section of that text], by contrast, starts bluntly with **Dr. Geneva Smitherman**, a very narrative-like beginning. He focuses immediately and directly on the topic of the essay without any kind of backgrounding material, assuming a large common gnostology (knowledge base) with his audience. The Theme of the next seven sentences (with the exception of Sentence 2) is baldly Smitherman, which he realizes as either the titled **Dr. Smitherman** or **she**. Only with Sentence 9, a third of the way into his essay, does Chang shift to a new Theme.

Chang's theme structure is straightforward. He uses only topical Themes; his text contains no textual or interpersonal Themes. By contrast, Jenni makes extensive use of interpersonal themes and has several textual themes as well. In addition, Jenni's themes are complex, each involving several major notions and modifying concepts. Chang's themes are, with the exception of Sentence 2, all simple and unadorned.

5. Cohesive Chains

A second important area for investigation within the textual component is that of cohesion. According to Halliday and Hasan (1976), cohesion is what makes a series of sentences form a unified whole rather than an unrelated collection. This cohesion is semantic rather than structural; that is, elements of text cohere by virtue of meaning relationships. In English, there are four ways that cohesion is created in a text: reference, ellipsis, conjunction, and lexical cohesion (Halliday 1985:288).

As we analyze text we can trace semantic notions by mapping the elements that realize these notions. When a writer composes, a cohesive effect is achieved by the selection of vocabulary and the choice of types of reiteration. Halliday emphasizes that "all texts display cohesive chains made up of some combination of lexical repetition and reference" (1985:365). These

chains are interwoven in various ways through the text creating the essence of the discourse as a coherent message.

The two Smitherman texts each contain six major thematic cohesive chains. Though Chang and Jenni distribute and pattern the chains in different ways, the notions that comprise the chains themselves are shared: Smitherman, the speech, culture, communication, ego, and audience.

The most frequently mentioned notion for both texts is Smitherman, both as Theme and in terms of overall tokens. But the Smitherman chain is not similarly distributed in the two texts. Chang focuses heavily on Smitherman throughout the text, and almost exclusively on this participant at the beginning. He clumps tokens close together, relying on pronoun reference for realization. Two-thirds of Chang's themes contain Smitherman tokens; one-half of his rhemes contain such tokens. Jenni's Smitherman tokens are more spread out, both throughout the text and between thematic and rhematic material. While Chang brings Smitherman into the essay as unIntroduced first Theme (the very first participant), Jenni introduces Smitherman into the text in the rhematic portion of a long dependent clause that opens Sentence 3 and forms the Theme of that sentence. Both Chang and Jenni bring Smitherman into the text as **Dr. Geneva Smitherman**, but only Jenni prefaces this with an introductory phrase. She first gives us "an African-American orator", choosing the non-specific **an** instead of the definite article **the**, which she might have easily used in its predominant function in written English as a cataphoric referent.

The ego chain is also revealing of the differences in the construction of the two texts. In Jenni's text, six tokens from this chain appear as thematic material and ten as rhematic material. Chang only makes four mentions of the 'I', all as Theme. We have already noted that Jenni makes greater use than Chang of interpersonal theme and modality. The overall contrast in effect is that Jenni acts as a more direct participant both in the event she is writing about and in the interaction of the communicative act of writing itself. Jenni takes on an intimate and clear role in relationship to her audience. Chang's role is more one of omniscient narrator and reporter. Chang does not insert himself into the text until Sentence 14, halfway through the essay. Here, like his introduction of Smitherman, he simply jumps into the flow of the text.

6. Information structure

A third aspect of the textual function that is worth exploring is that of information structure. In written English text, the clause is the information unit, and it is this unit that focuses the reader on what the writer is presenting as news, the New, that which the reader is invited to attend to. Given information, by contrast, is that which is presented as already known to the reader, either because it has a clear referent in the text or context of situation, or because it is already in the mind of the reader. The information focus is the New, and, in English, this typically falls at the end of the clause (Halliday 1985:316). If we look at information structure and its intersection with reference, we can see other important contrasts in the two texts under analysis.

Jenni begins with entirely new but generalized information. Sentence 1 contains only general background material and assumes no specific reader knowledge of either the event or major notions involved in it: 1) **their** is cataphoric to the generalized exophoric **everyone**, a clear use of homophoric reference; 2) the Speech Chain is next introduced into the text with **a lecture of some sort**, the non-specific a being reinforced by **of some sort**; 3) **people of the same race** is a generalized notion introducing the Culture Chain; 4) finally, **they** is anaphoric to **everyone**.

Sentence 2 contains four **the's** and moves the initial generalized statement one step forward to a particular but vague instance, not the event under discussion. Sentence 3 introduces the event itself. **Dr. Geneva Smitherman** is prefaced by **an African-American orator**, **orator** being immediately anaphoric to **lecturer** in Sentence 2.

Thus, Jenni's first sentence is entirely generalized. She makes no attempt to move beyond the general and introduce any event-specific information. Sentence 2 simply moves Sentence 1 to a particular but not a specific instance. Only in Sentence 3 does Jenni introduce any event-specific notions.

By contrast, Chang immediately brings new information into the text as if it were given. He begins with **Dr. Geneva Smitherman**, presenting as given what is, in fact, news. This is reinforced by the use of **her speech**, more new information presented as given. The **her** makes **speech** specific but there is no readily apparent referent. In Sentence 2, both **the's** assume reference, but only the initial **the** has a retrievable referent (**speech** in S1). **the Negro Black History week** has neither a clear endophoric referent nor a commonly recognized homophoric one (like **the Fourth of July**).

While a book is presented as non-specific information, **Dr. Woodson** is both specific and New; like Smitherman, Woodson is brought un-introduced into the text.

The total effect is that Chang assumes a large common gnostology with his audience. This narrows both the audience and the context within which he expects them to be reading his essay. The result is reminiscent of oral text delivered within the immediate time frame of the event the text is reporting, and may be the result of class and/or peer discussion that most likely followed a similar pattern of reference and information structure. But while the information stance Chang takes indicates a narrow audience of like-informed peers, his use of **a group of college students at Alma College** belies this intimacy by explicitly introducing into the text as new that very audience. This noun phrase is, in fact, Chang's only presentation of a notion as actual news. The other notions presented in this semantically-loaded first sentence are, in fact, news as well but they are presented as if given.

The overall organization of textual structure clearly distinguishes Chang's essay from Jenni's. Chang's essay, especially the first section, is a narration of Smitherman's speech: here is what she said. He describes the event as it unfolds and puts the reader at the scene. Chang's role is that of omniscient narrator. By contrast, Jenni's essay is a logical argument. Her first paragraph is typical of the overall structure of the text. She develops her central thesis in classical deductive fashion, starting with the general and moving to the specific, laboriously and painstakingly leading up to her thesis statement at the end. Jenni's role is that of intimate participant in and analyzer of the event.

7. Conclusion

How do these essays differ? Are these differences substantive and what evidence is there that any of these differences might be the result of native competence versus non-native artificial construct? As all of us learn to compose following the conventions set forth for a particular genre and register, we rely heavily on the unconscious underlying structures of our language, both those of a lexico-grammatical nature and those that exist on a more macro level. If the language we are using is not our native language, we have fewer unconscious resources at our disposal for doing so. It is not enough to have gained control of the basic vocabulary and syntactic patterns; we must also have stored somewhere in our mental repository the schemata for a 'good' narrative or a 'good' expository

essay. We must be able to infuse a piece of writing with the correct overlays of voice and mood, and the subtleties that go into the construction of reality as seen through a particular cultural lens.

Chang's essay certainly seems to differ from Jenni's. Jenni's fluency of discourse construction makes Chang's struggle with the resources at his disposal awkward by comparison. Chang's thematic development is a simple, down-the-line structure where one notion is Theme for a stretch of text, and then another notion becomes Theme for another stretch of text. Jenni uses a more complex zigzag thematic development. Where Chang clumps major notions in groups, Jenni intersperses notions more evenly throughout the text. Chang is also less adept than Jenni at the construction of information focus. He brings participants into the text without backgrounding or introduction, often presenting entirely new ideas as if they were already given. The overall difference in effect is that Jenni's essay seems a more cohesive whole, one in which the various parts are intricately but carefully interwoven to create a clear and interesting pattern. Chang's essay, while coherent, does not quite hang together as a smooth single entity; the various parts are readily apparent and easily extracted from the whole.

What differences in text construction are a result of native versus non-native fluency and what are simply individual differences in the ability to carry out this particular task are, of course, impossible to know for sure from the limited analysis done here. But our knowledge of how writers compose, what comprises native competency, and how different cultures realize reality in different ways can lead us to positing areas where non-native English writers, even rather fluent ones, might run into composition problems.

Writing, unlike speaking, is not a natural process; it is something that we actively acquire. Writing represents language, and the relationship of this written representation to the system underlying it varies from culture to culture and language to language. As a result, the conventions employed in the construction of any semiotic system will be both specific to that system and a reflection of the language it represents. As we analyze the composing of non-native English writers, we need to keep in the forefront the intricacies that go into making all of these various systems work together to form a cohesive and meaningful piece of writing.

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Appendix

Chang's Text: Text 1

1. Dr. Geneva Smitherman delivered her speech, "The miseducation of the Negro and you too!" to a group of college students at Alma College. 2. The topic Dr. Smitherman used was based on a book by Dr. Woodson who had established the Negro Black History week in 1926. 3. She decided to choose this topic because she wanted to send a message to everyone about the necessity of a culturally diversified education system, which would promote a wider communication between all races in America.

4. Dr. Smitherman said that the current education curriculum does not tell or represent the real history of Americans. 5. She believed that not only Black people and other races of color had been miseducated, the predominantly white population had been miseducated also.

6. Dr. Smitherman proposed a diversified curriculum which reflects the history of all races. 7. She believes that the only way of achieving a true education is through a system which combined all cultures, literature and history of all races in America. 8. She proposed a National Language Policy which would enable everyone to deal with a multilingual and multidiverse population. . . .

Jenni's Text: Text 2

1a. At some point in their life everyone will hear a lecture of some sort, usually given and attended by people of the same race, 1b. and they will most often understand what is being said and feel comfortable. 2. It had always been my assumption that the non-white members of the audience could relate to the statements and the experiences of the lecturer. 3. When I recently had the opportunity to listen to an African-American orator, Dr. Geneva Smitherman, address a mixed audience I found that my supposition could not have been more incorrect. 4. I was surprised to find that there were things she had to say that I could not understand. 5. While listening to Dr. Smitherman address a mixed audience there were times that I felt left out because I could not relate to the things she was describing. 6. I had never attempted to switch roles and view the flip side. 7. It made me start to wonder, if I had trouble relating to the ideas a colored speaker presented, did African-Americans have problems relating to a white speaker? 8. I realized that something must be done to educate each group of people about the other, starting with the language barrier.

RESULTS FROM THE RIGHT SIDE UP TEST: A CROSS-CULTURAL STUDY OF YOUNG CHILDREN IN THE UNITED STATES AND CHINA

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This study was part of an ongoing series of investigations into the observational abilities of young children conducted in the United States and the People's Republic of China. It examined one micro feature of young children's earliest knowledge about literacy, specifically their knowledge of elementary components of the writing system.

Our previous investigations had indicated that very young children who had not received any formal literacy instruction had already begun to unravel fundamental aspects of their culture's writing system. We were interested in even earlier evidence of what such children might already know as a result of their own casual, informal noticing of the writing system.

While a great deal of literature is devoted to children's literacy instruction, very little examines the knowledge of the writing system children acquire before formal instruction.

In his book *The Emergence of Literacy*, Hall questions the validity of assumptions that are inherent to conventional literacy instruction:

Children, from birth, are witness to both the existence of print and the relationship between print and people. It would seem strange, given the way that children involve themselves in all aspects of their world, if anyone suggested that there was one part of that visible world about which children were totally ignorant. Yet that is precisely the assumption that underpins so much conventional instruction. There has been almost universal acceptance that either children are ignorant about

the nature and purpose of literacy unless they are "taught" it, or that what children know is of no importance whatsoever in devising teaching strategies. The overall effect of such views is that there has been a devaluation of children's competence, and an emphasis on direct instructional practices (Hall 1987, p. 2).

Ironically, as early as 1898 Harriet Iredell, an American school teacher, had recognized young children's emerging knowledge of literacy. Iredell wrote:

We never cease to wonder at the extent and amount of knowledge accumulated during the first three years of life nor at the rate of development of the little creature. We say, 'Let this go on through the first years of school life and what may not be done.' But something bars the way. We are told, 'He must learn to read and write.' As if he had not already taken the first steps, and of his own volition, his efforts unrecognized for what they are (In Hall 1987, pp. 4-5).

The purpose of our investigation was to recognize those efforts by studying one micro feature of children's knowledge and thereby developing a more accurate profile of their early abilities, specifically with respect to the writing system.

The Right Side Up Test was administered to 2 to 4 year old children to evaluate certain aspects of early knowledge about two differing writing systems. The children were attending preschools in the United States and China, but had not yet received any formal school writing instruction.

The preschools were selected primarily as the organizations that were the most cooperative in facilitating our research. As such, the sample of preschool children included in this study were not intended necessarily to reflect an accurate representation of the entire population, but they were not exclusive types of schools; there were no special admissions policies and they made no special claims as to the children's abilities.

The test was designed to evaluate visual awareness of writing of children who might not yet be ready to respond verbally to our inquiries. Although the test included encouraging verbal behaviors, it was designed not to require verbal directions. Each of the children was individually shown, one set at a time, 3 sets of different visual images that were printed on laminated 3" x 3" cards. The sets consisted of images of (1) familiar, non-culturally specific objects (like a chair, or a bicycle); (2) capitalized English letters; (3) Chinese characters, which were fairly common, but not likely to be known for the meanings. The images were presented flat on a table and, with respect to the subject, in incorrect orientations. The child was to turn each of the cards to the correct upright position, for we estimated that the upright position might be one of the first aspects of the writing system that children would learn, as an example of knowledge that even pre-verbal children had learned.

The set of pictures of familiar objects illustrated the task. We wanted to establish that they understood what they were expected to do. If the scores for the pictures were high, the result would guarantee that the children understood. If the children had problems getting started we would turn one of the pictures to the correct position to demonstrate. Children who were unable to turn at least 3 pictures to the correct position on their own with repeated prompting and demonstrations were not included in the results. That, however, did not occur with any child over 2 years old.

Results

Eighty-five children were included in our study, 44 from the United States and 41 from China. The mean ages for the groups were 3.4 years old for the U.S. and 3.5 years old for the Chinese. On the picture section given first, the U.S. children scored with 94 percent accuracy and the Chinese children scored with 99+ percent. The lower U.S. children's score we concluded as related to the pictures used from a Chinese book. Also with U.S. children, there was a small hesitation to follow the verbal directions without actual demonstrations when compared with the scores of the Chinese children. The results

indicated that the children were able to complete the first task correctly, with items presumably more easily recognizable than abstract elements of a writing system.

We next evaluated their knowledge of one elementary component within their own culture's writing system, i.e. correct upright position of letters for U.S. children and of characters for Chinese children. As expected, Chinese children were far superior with Chinese characters. Letters and characters were both given to both groups. As Chinese also use an alphabetic form of writing, there is a cultural familiarity with Roman characters.

The Chinese children were able to position the characters correctly with a frequency of 67 percent, and the U.S. children positioned the letters correctly with a frequency of 71 percent.

That the Chinese children scored 43 percent accurately with the letters was not surprising, because Roman letters are used in China. The U.S. children scored 34 percent accurately with the Chinese characters. There were 4 different positions in which the characters could be placed. Hence there was a 25 percent random chance that the children could have placed the characters in the correct position. The possibility that the sample of children we used was not representative of the population may account for the 9 percent difference beyond random chance. Although the sample of U.S. children was culturally diverse, they were less than 10 percent Asian American. Furthermore, none of the participating U.S. preschools was located anywhere near a Chinatown area. Where could U.S. children with little exposure to Chinese writing begin to learn the correct upright position for Chinese characters?

The 2 year old U.S. children scored 28 percent accuracy with the Chinese character set, little better than random chance. The 3 year olds scored 32 percent, and the 4 year old children scored 37 percent. Even if the youngest children's responses reflect random guesses, there is a systematic improvement in the accuracy between the ages of 2 and 4 years. It is unlikely that this is the result of an increased exposure to Chinese writing, brought on, for example, by a

sudden appetite for Chinese cuisine. More likely there is an internal logic to the correct orientation of Chinese characters contained within the visual structure of the characters themselves or that there were some extraneous visual indicators of orientation contained in the particular reproductions we used (perhaps small variations in line widths, indicative of stroke directionality and consequently of character orientation). As neither is counter-indicated by the test results, this suggests a deficiency in this study, and a consideration for our future research. Perhaps the abilities involved in knowing the proper orientation for English letters also provide the skills for deciphering the Chinese characters or that the children had learned enough about the process of mark making to recognize indicators of directionality contained within the strokes themselves.

During the pre-tests a number of children were observed, without direction, arranging the cards into linear formats, in the same way that units of writing systems are aligned in rows or columns. We were interested in the number of children that automatically arranged even non-literacy images like the pictures into rows and columns without being directed to do so. Fifteen of the 44 U.S. children arranged the pictures into horizontal linear rows on their own initiative. Twenty four of the 41 Chinese children arranged the pictures into horizontal rows, and another 5 arranged them into vertical columns, for a total of 71 percent. Perhaps this is indicative of organizational discipline and attention to minute visual details. The children were neither instructed nor encouraged in this regard.

Conclusions

Although many literacy instruction curricula begin with the presupposition that children know nothing about reading and writing until they are taught, this study contributes to the findings of a growing body of research into literacy development in young children by demonstrating some specifics that children know about writing systems before they receive formal language instruction.

Sulzby writes:

One clear implication of all the research in emergent literacy is that children know far more than we acknowledged in our schools and instructional programs at the point when children begin formal schooling (Sulzby 1981, in Farr 1986, p. 196).

To be most effective, educational curricula need to be founded on an accurate evaluation of students' abilities and knowledge. This study suggests implications for the revision of conventional literacy instruction curricula. More importantly, our research recognizes the remarkable visual learning abilities of young children who span diverse cultures and writing systems and hence generates a more accurate profile of children's knowledge.

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ON THE COPYING ABILITY OF YOUNG CHINESE AND AMERICAN CHILDREN

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In January of 1990 I went to Nanjing, PRC, with a fellow researcher, Nancy Pine. We wanted to learn more about the early traces of literacy in young children and their ability to copy Chinese characters, English words, and pseudo-characters (groups of lines that are roughly similar to Chinese characters, but which have no meaning). We were assisted by many English-speaking Chinese colleagues from Nanjing University and Nanjing Normal University. We owe a large debt of thanks to John Regan whose advise and help were essential.

Chinese Orthography

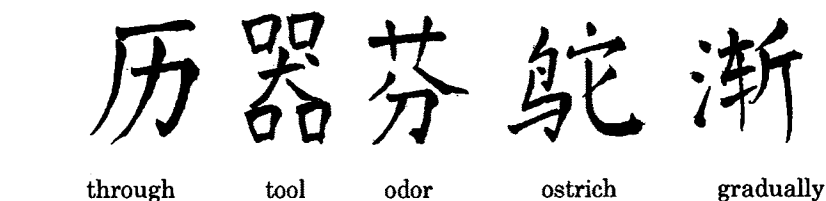
Different orthographies present different challenges to those who must learn to read and write them. To understand English one must be able to recognize sound/symbol relationships. Only moderate demands are made on visual memory. The reader of Chinese must be able to recognize thousands of characters and recall their meaning and associated sound quickly and accurately. Heavy demands are made on visual memory. The reader either knows a particular character or they don't. Context may offer clues to the character, but characters cannot be decoded or "attacked" in the way an unfamiliar English word can sometimes be parsed.

We believe that the nature of the Chinese language has obliged Chinese educators to develop effective techniques to develop the necessary visual memory discrimination skills. We believe the data to be presented support this argument. However, we were surprised that preschool children, who had received no instruction in reading or writing, also showed well developed copying skills.

Chinese Preschool Data

Before leaving for China, 5 characters were selected for copying tasks. They were chosen because of their increasing complexity and because they were unlikely to be familiar to young children. The character for "tool" has more strokes than the character for "odor," but its symmetry makes it easier to recall and copy. The characters are reproduced as Figure 1 with their approximate English meanings written beneath them.

Figure 1. Chinese Characters Used In Copying Tasks.



None of these characters is introduced to students before second grade, when "ostrich" is introduced. It is a national policy in China not to introduce writing instruction until children enter first grade. However, some parents do home teaching, and many children have learned to write their names before entering first grade and can recognize or write some common characters.

Figure 2. Five Ersatz Characters Used In Copying Tasks.



Teachers were asked, through an interpreter, to have their students copy the five characters which were displayed at the front of the room. Characters were approximately 10 X 10 cm., and students were allowed as much time as needed to complete the copying. The characters were copied by 3 classes at the Nanda Affiliated Preschool in Nanjing, PRC (the affiliation is with Nanjing University). Groups of 3- 4- and 5-year-old children copied the figures, 65 students in all. The results were analyzed in two ways. In one, the author, with help from native speakers, analyzed each character for omissions, additions, distortions, and reversals. The results of this analysis are shown in Table 1.

Table 1 shows that omissions are by far the most common errors found in the work of these young students. When attempting to copy the characters they did not include all of the necessary strokes, and in some cases omitted significant portions of the target character. After omissions, distortions were the most common errors. The child attempted to copy the stroke or element of the character, but did so in a manner that significantly distorted its true form. These children made no reversals, surprising as young children in the United States make frequent reversals. They are quite common and are considered a normal part of the process of developing literacy. Why they occur so infrequently in the work of young Chinese children is not known.

Table 1. Analysis of Three Preschool Classes' Copying Errors.

SCHOOL/CLASS	Omission	Addition	Distortion	Reversal	Percent Legible	Total Errors
1-4-90 Nanda Preschool N=20 3-4 yrs	39/100 39%	2/100 2%	11/100 11%	0/100 0%	48/115 42%	52/100 52%
1-5-90 Nanda Preschool N=23 4 yrs +	48/115 42%	2/115 2%	20/115 17%	1/115 <1%	47/100 47%	70/115 61%
1-5-90 Nanda Preschool N=22 5 yrs	10/105 9%	0/105 0%	4/105 4%	1/105 <1%	75/105 71%	14/105 13%
Totals N=65	97/320 30%	4/320 1%	25/320 8%	2/320 <1%	170 53%	138/320 43%

The characters copied by the preschool children were also evaluated for legibility. A native speaker and retired professor of Child Development from Nanjing Normal University examined each character for legibility. The results of this analysis are shown in Table 1. The separate analyses produced generally similar results. Four- and five-year-old children made fewer errors than 3-year-old children; overall, the preschool children made errors on about half of the characters they attempted to copy. Even though the five-year-old children made many errors, the overall quality of their copies was judged as being better than that of the younger children. Their characters were smaller and better organized internally as well as on the page. Their work was neater and generally more pleasing. Examples of the copies made by preschool children are shown in Figure 3.

The characters copied by the youngest children were generally larger, less well formed, less organized internally, and less organized in terms of their placement on the page. Even though there were not large differences in the total number of errors made by the three groups of preschool children, the overall quality of the older childrens' copying was better. While none of the preschool children had received instruction in writing Chinese characters in school, the quality, if not the accuracy and legibility of the older childrens' writing was clearly better. The difference can be seen in Figure 3. It is assumed that the improvement resulted from maturation and possibly cross-over learning from instruction and practice in drawing and painting. Home instruction may also be a factor.

Figure 3. Copies made by Chinese Preschool Children.

Three-year-old Children

Three legible. N=5

Four legible. N=2

Five legible. N=1

Four-year-old Children

Three legible characters.

Four legible characters.

Five legible characters.

Five-Year-old Children.

Four Legible Characters.

Five Legible Characters.

Chinese Primary School Data

When we started visiting primary schools we initially followed the same procedure used in preschools and asked students to copy the same 5 characters that were used with preschool children. However, preliminary analysis in the field revealed that there were very few errors to analyze. Almost all of the students in first and second grade copied the 5 characters without error. In the first primary school we visited there were only 2 errors in the 260 characters copied by the 52 first grade students in a class of 6-year-olds. The data for primary school students are summarized in Table 2. Data are from first and second grade students, 5 and 6 years of age, in 3 schools. The legibility, quality, and consistency are dramatically better

Table 2. Analysis of Chinese Primary Students' Copying Errors.

SCHOOL/CLASS	Omission	Addition	Distortion	Reversal	Percent Legible	Errors/ Attempts
1-6-90 Zhu Jiang N=52 gd 1, 6 yrs Chinese	0/260 0%	1/260 <0.5%	1/260 <0.5%	0/260 0%	259/260 100%	2/260 <1%
1-8-90 Gu Lou N=43 gd 1, 6 yrs Chinese	1/215 <0.5%	0/215 0%	4/215 1.9%	0/215 0%	215/215 100%	5/215 2.4%
1-10-90 Zhu Jiang N=52 Gd 1, English	11/260 4%	2/260 <.7%	5/260 2%	0/260 0%	249/260 96%	18/260 7%
1-8-90 Gu Lou N=39 gd 1 Chinese	0/195 0%	0/195 0%	0/195 0%	0/195 0%	195/195 100%	0/195 0%
1-8-90 English	1/195 <.05%	0/195 0%	0/195 <.05%	0/195 0%	192/195 98%	1/195 .1%
1-8-90 Ersatz	0/195 0%	1/195 <0.5%	18/195 9%	0/195 0%	175/195 90%	19/195 10%
1-15-90 Rei Jin Bei Cui N=40 gd 1 Chinese	1/200 0.5%	0/200 0%	1/200 0.5%	0/200 0%	200/200 100%	2/200 1%
1-15-90 English	1/200 <0.5%	1/200 <0.5%	0/200 0%	0/200 0%	198/200 99%	2/200 1%
1-15-90 Ersatz	0/200 0%	0/200 0%	0/200 0%	0/200 0%	200/200 100%	0/200 0%
1-8-90 Gu Lou N=38 gd 2 Chinese	1/190 <0.5%	0/190 0%	0/190 0%	0/190 0%	190/190 100%	1/190 <0.5%
1-10-90 Zhu Jiang N=45 gd 2 Chinese	0/225 0%	0/225 0%	1/225 <0.5%	0/225 0%	221/225 98%	1/225 <0.5%
1-10-90 English	9/225 4%	5/225 2%	6/225 3%	1/225 <0.5%	224/225 >99%	21/225 9%
Totals 309 Students	21/2755 <1%	5/2755 <1%	17/2755 <1%	1/2755 <1%	2518/275 5 91%	44/2755 1.6%

than in the copies of preschool students. Consistency is found in the work of individual students and within the work of class groups; characters are all nearly equal in size, spacing, and orientation on the page and to each other.

Because primary school children made so few errors in copying Chinese characters we added two groups of five additional figures to provide them

with a more difficult task. Five ersatz "characters" were created and five English words were chosen to be added to the copying task. The ersatz characters are reproduced as Figure 2. Like the Chinese characters, they increase in complexity, based upon the number of elements, or "strokes" they contain. By using these figures, I sought to challenge the students' copying abilities with a task that was superficially like copying Chinese characters, but which did not contain any recognizable patterns or meaning that might make them easier to copy. The English words also selected on the basis of increasing complexity and because they contained about the same number of elements, or "strokes." They are 'dye', 'tool', 'other', 'ostrich', and 'gradually'. Originals of the words and characters were used in China, They were scanned and laser printed to the same size for use in the United States. The same symbols were used in all copying.

It is important to consider the respective roles of maturation and training. As children age we expect that their ability in many areas will improve, but we also expect training to cause improvement. The preschool and primary students tested showed remarkable ability differences. The number of legible characters copied by preschool students did not show much change between three and five-year-olds. However, once the children started primary school and began to receive writing instruction there was a dramatic improvement in their ability. Among first and second grade students there were only 5 of 89 students who failed to copy all five characters correctly. It is important to realize that the first grade students had only received a few months' of instruction in writing. School started in September, and the copy data was gathered in early January. The relatively slow improvement from the ages of three to five years and the rapid improvement shown after a few months of instruction suggest that Chinese educators have developed effective methods of teaching large numbers of students to copy and recall complex visual forms.

American students in grades one through four were given the same copying tasks. The results of their work are summarized in Table 3. As expected, the American students did well when copying the English words, achieving 95% to 100% legibility and making from 3% to 8% errors. Even so, their scores were slightly lower than those of Chinese students of about the same age. The American students copied a total of 345 of 355 (97.2%) English words correctly. For comparison, Chinese students copied 863 of 880 (98.1%) English words correctly Chinese students were slightly better at copying Chinese than were American students at copying English. They copied 1280 of 1285 (99.6%) Chinese characters correctly. American students had most difficulty with the Ersatz figures, copying from 25% to 72% of them legibly (26/105, 25/45, 81/140, 47/65). In contrast 95% of Chinese students who copied Ersatz figures did so legibly, one group made no errors (175/195, 200/200).

Table 3. Analysis of American Primary Students' Copying Errors.

SCHOOL/CLASS	Omission	Addition	Distortion	Reversal	Percent legible	Total Errors
Monrovia, CA. 10-92 Gds 1 and N=28 Chinese	30/140 21%	10/140 7%	31/140 22%	5/140 4%	90/140 64%	74/140 53%
English	1/140 <1%	0	1/140 <1%	3/140 2%	137/140 98%	5/140 4%
Ersatz	30/140 21%	11/140 8%	43/140 31%	5/140 4%	81/140 58%	89/140 64%
Sandusky, MI 10-92 Gds. 1 & 2 N=21 Chinese	51/105 49%	3/105 3%	50/105 48%	1/105 <1%	20/105 22%	105/105 100%
English	3/105 3%	1/105 <1%	1/105 <1%	2/105 2%	100/105 95%	7/105 7%
Ersatz	56/105 53%	9/105 9%	72/105 69%	0	26/105 25%	137/105 130%
Sheperd, MI. 10-92 Gd 3 N=9 Chinese	14/45 31%	2/45 4%	25/45 56%	0	23/45 51%	38/45 84%
English	0	0	0	0	100%	0
Ersatz	12/45 27%	2/45 4%	29/45 64%	0	25/45 56%	43/45 96%
Sheperd, MI. 10-92 Gd. 4 N=13 Chinese	12/65 18%	0	16/65 25%	0	48/65 74%	28/65 37%
English	1/65 2%	0	5/65 2%	0	63/65 97%	6/65 3%
Ersatz	7/65 11%	1/65 2%	20/65 31%	0	47/65 72%	28/65 43%
Totals 71 student	217/1065 20%	39/1065 4%	293/1065 28%	16/1065 2%	705/1065 66%	605/1065 57%

It is in number of total errors made that the most significant differences in copying ability between American and Chinese students are found. Chinese

students made from 0 to less than 10% (1.7% average) total errors on all copying tasks. American students errors ranged from 0 to 131%, averaging 57% (605/1065). Why this large difference should exist is uncertain. It reflects a generally higher level of organization and overall neatness in the work of Chinese students. They made fewer errors of all types, but not in any significant pattern. The work of American students was on a much larger scale and had larger spaces between figures. Examples of more legible figures copied by American students are given in Figure 4. Comparison with figures copied by Chinese students in the same grades can be made by looking at Figure 5.

Figure 4. Best Copies Made By American Students.

gradually
ostrich
other
tool
dye
① ② ③
④ ⑤ ⑥
⑦ ⑧ ⑨
⑩ ⑪ ⑫

Grade 1



Grade 2

① tool ② ③
dye ④ ⑤
other ⑥ ⑦
ostrich ⑧ ⑨
gradually ⑩ ⑪

Grade 3.

① ②
③ ④
⑤ ⑥
⑦ ⑧
⑨ ⑩

Grade 4.

Figure 5. Typical Results of Copying Characters, Ersatz Characters, and English Words For Chinese First Grade Students.

历 芬 器 鸵 渐

历 芬 器 鸵 渐

dye tool other ostrich
gradually

历 芬 器 鸵 渐

历 芬 器 鸵 渐

dye tool other ostrich gradually

历 芬 器 鸵 渐

历 芬 器 鸵 渐

dye tool other ostrich gradually

历 芬 器 鸵 渐

历 芬 器 鸵 渐

dye tool other ostrich gradually

Discussion

Visual memory is important to the reader of Chinese, and Chinese schools have developed effective methods of developing visual memory. A serendipitous incident provided dramatic evidence for this idea. I visited the Zhu Jiang Road Primary school early on the morning of January 6, 1990, and had three classes of first and second grade students copy the five characters. Upon returning to the school four days later the director said that she had something interesting to show us. The students had copied the figures at 8:50 in the morning, and completed the rest of the morning in the ordinary way.

After the children returned from lunch at about 1:00 PM the teacher had an idea, and asked her students to see if they could recall the characters they had written in the morning and to write them again. Of the 53 students in the class, 33 wrote the 5 characters correctly, 11 wrote 4 correctly, 7 wrote

3 correctly, and 1 student wrote 2 correctly. None of the 52 students failed to recall at least one character. Working from a model, this class was almost 100% accurate (259/260) in copying Chinese characters. Working from memory they wrote with 89% accuracy (232/260).

The performance of these students is even more noteworthy when one considers that they were not instructed to recall the figures or told that they would need to write them again. Moreover, none of these characters had been taught to the students and none was likely to be familiar to them. They recalled and correctly wrote the figures after having seen them for a few minutes and writing them once. The teachers and directors at the school were surprised by the students' ability, that is why the copies were in the director's office. The students either remembered the character and wrote it correctly or they made no attempt to write it. There were no cases where a student wrote a different character, a part of a character, altered the arrangement of the parts of a character, or otherwise changed it.

The data presented here add to the growing body of evidence that those who grow up in China, partly because of the unique nature of the Chinese language and its orthography, and partly because of other cultural factors, develop visual memory and visual discrimination skills that appear to surpass those of American children. While the nature of the Chinese language and its orthography is a factor in the development of these abilities, there are probably many other complex cultural factors that also play a role. This is demonstrated in the findings of Liu (1978), Hung (1980), Pine (1991), Tzeng, and others, that cultural traces can be found in childrens' earliest graphical productions. This is a rich area for further inquiry, and one that may provide insights of value to many disciplines.

This preliminary research will form the basis for a more extensive project to be carried out in the PRC and the United States, using a variety of stimuli with students from a wider age range. Our hope is that greater understanding of intercultural ability differences can lead to more effective learning and greater intercultural understanding.

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XII

MISCELLANEOUS STUDIES

LINGUISTICS AND PEDAGOGY: CRITICAL CONSIDERATIONS IN TEACHER EDUCATION

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Presently it is possible for future teachers of foreign languages at the high school or college level to complete their studies and enter the teaching profession without having learned many of the most rudimentary and significant facts about human language (such as an estimate of their approximate number, their intricate interrelationships, and a tentative outline of their development). The future professor is likely to affix the Ph.D. to his/her name without having gained adequate insight into many of the most fundamental components of English and the target language he/she is about to teach.

The reasons for this lack of linguistic knowledge are numerous, but two reasons are prevalent in our academic orientation:

First, perhaps more than any other single factor, a deep-seated, pervasive, yet tacit conviction still lingers: that foreign language studies are merely introductory and ancillary to the study of masterpieces of literature written in the target language. This phenomenon is easily observable since foreign language instruction at the beginning and intermediate levels is usually left to teaching assistants and instructors. Literary analysis is reserved for senior professors. This predominant emphasis on literary studies crowds out potential survey courses of applied and comparative linguistics.

Secondly, a general uncritical acceptance of the traditional principles of liberal arts education compels most future professors and teachers to take a large number of courses totally unrelated to the nature of language. 101-102 courses in math, physics, biology, chemistry, political science, and "grab bag" courses which offer cursory glances at random details of history and the like fill up available slots in the curriculum. These curriculum requirements seem to be so sacred that even committed linguists are prone to accept that there is no room for a basic applied linguistics course for language teacher candidates because they have to get a "well-rounded, liberal arts education."

In the relatively few instances in which a linguistics course is required of majors in foreign language education, that course typically offers **too much too late**. It does not select judiciously vital, practical aspects of linguistics which would be applicable to teachers' future professional needs.

The goal of an introductory linguistics course for language teachers must be to highlight and analyze, in particular, the relationship between the native and target languages through cross-linguistic comparisons. The implicit knowledge that native speakers of any language have of their mother tongue (or any second language acquired by total immersion) is inadequate for the purpose of teaching. Thus, it is imperative that students be taught consciously to recognize the nature, function and causes of sophisticated phonological, lexical, and syntactic features in their own and the target language to be able to provide linguistically cogent parallels to their students.

In this paper, I briefly touch upon some examples of the benefits to be gained from applied linguistic courses and offer only few concrete examples in the four areas of phonology, orthography, morphology and syntax. I will use primarily German examples to illustrate.

Linguistic and Pedagogical Principles

The pedagogical principle underlying the following linguistic examples is that of utilizing students' background knowledge (Ausubel, 1978) in the form of their native language to draw parallels to the foreign language. One critical aim in second language teaching is to bring the learner to the point of proficiency where one's pronunciation and syntax does not impede communication—where the learner's speech can be understood especially by interlocutors who are NOT used to dealing with nonnative speakers of the target language (Ludwig, 1982; Schairer 1992). In order to achieve these goals, these linguistic and pedagogical principles must be realized on a conscious, metacognitive level, if they are to be applied by teacher candidates to their teaching.

Phonology

A general lack of comparative study of phonology becomes patently obvious on the basis of the elementary mistakes committed even by textbook writers in introductory instructions. These writers typically misidentify English phonemes as being synonymous with those of the target language, thereby misleading students and teachers onto a path of practically no return. One example is the blatant misidentification of the French, German, Italian and Spanish phoneme /a/ (as in German *Tag* or *Rad*) with the English /a/ phoneme (as in *father* or *dog*). Equating the two phonemes negates a significant distance between these phonemes on the vowel triangle and beclouds phoneme perception, consequently leading to fossilization of mispronounced forms in the target language (Selinker, 1974).

If teacher-candidates are to guide students toward native-like pronunciation, it is vital for them to apply articulatory phonetics to analyze the physical steps needed to produce the target language's phonemes; for

example, rounding the lips for ö as in schön and ü as in grün, or pronouncing the stop phonemes /p, t, k/ without aspiration. Perhaps more salient are the examples where teachers can help their students by dissecting native phonemes into sounds which can be produced in isolation and subsequently blended together into target language words.

In this vain, adequate comparative phonological study should lead to the recognition that to approximate the /a/ in French, German, Italian or Spanish, one could dissect the English /ay/ diphthong. Its vocalic section can be identified with the /a/ of the aforementioned languages. Its semivowel glide section can be identified with their English /y/ phoneme whose American version of the IPA symbol is the "y". The next step is to practice selected words exemplifying /a/ in the target language, using them in functional utterances. These examples should be combined with constant reminders and demonstrated comparisons with the first half of the English /ay/ in English words that have identical phonemic environment. For example, practice of German Tag in Guten Tag can be aided by enunciating the first portion of the English diphthong /ay/ in "tie" exceedingly slowly, stopping before the "y" glide is pronounced and adding the final consonant of Tag. Similarly, German Rad can be pronounced by having students pronounce the English word "rye" in the same dragged out fashion.

Another example is the German /u/ phoneme which is substantially more rounded than the English /u:/, as in tool, soon, pool, or rule. This phoneme can be introduced in its long version, through English words where /u:/ is followed by "l" as in "fool" and "rule." The markedly velar dorsal English "l" becomes a quasi-semivowel and the resulting English /ul/ sequence as in school, rule, pool, becomes practically identifiable with the German /u:/ which nearly approximates the practical fusion of the sequence of English /ul/. Logically then, German words featuring /u:/ followed by /l/ should be taught first, for example, Stuhl, Juli and Schule. The same principle of selection applies to the German short /u/ as in Null, Pult, Bulle.

Non-aspirated voiceless stops in Romance and Slavic languages can be brought into students' competence range if p, t, k are preceded by the voiceless fricatives /s/ when teaching students to move from aspirated pot, top, and cool to their non-aspirated versions in spot, stop, and school. In Spanish, kapitano incorporates all three non-aspirated fricatives.

Orthography

Linguistic perspectives will enhance the teachers' insight into the complex web of English orthography, in contrast to the phonemically and graphemically reliable systematicity of the German, Italian, Latin, Russian and Spanish writing systems. The recognition gained via the linguistic course will allow teacher candidates to understand why English letter names must never be used in foreign language teaching.

The practice of naming letters—such as "a" is for apple, "e" is for elephant, or "i" is for igloo—is perplexing and misleading even in the context of English in that letter names fail to provide adequate reference to MOST English phonemes. This discrepancy is magnified tenfold in the context of foreign language instruction—when linguistically untrained teachers fall back to referring to target language letters by English letter names, as in saying, "The letter 'i' (/ay/) is for ich, and Igel. Instead, teachers must concentrate on the regularities within the target language—constituting one situation in which cross-language comparisons are to be avoided.

Morphology

Insightful comparisons with English morphology can simplify internalization of morphological features of foreign languages. For example, teaching the sixteen different noun plural markers in German will be greatly facilitated by concretely paralleling them with similar English markers: The 0 plural marker of English beer, deer, milk, can aid in accepting the 0 plural suffix of German masculine and neuter nouns ending in -el, -en, -er, for example: die Löffel, die Wagen, die Lehrer. Another parallel to English can be drawn to the plural of child: the children—this helps to grasp the plural -er suffix of Kinder, Felder, Wälder, Geister, etc. Stem vowel change as a plural marker in mouse, mice; louse, lice is useful in introducing not only Mäuse, Läuse, but also Bäume, Häuser, and so forth.

Plurality, expressed with the -en suffix in English "oxen" helps not only the learning of the German "Ochs", Ochsen but also Mensch, Menschen; Elephant, Elephanten; Pilot, Piloten, etc.

Similarly, cognate markers such as the German infinitive suffix -en and its somewhat analogous English denominal verb suffix in fat, fatten, light, lighten etc. also allow valuable parallels to be drawn from the familiar native language. Cognate vocabulary, hidden by far-reaching phonological and semantic changes through centuries can be pointed out. Here not only the teachers' perspective widened but also the learners' acquisition facilitated. Such identities as English "town" versus German Zaun (fence), or "timber" vs. German Zimmer (room) illustrate rarely recognized cognates which represent challenges even to linguists.

Syntax

In addition to the basic SVO identity of German and English syntax, the puzzling and jarring effect of the VSO word order in German can be effectively taught by calling attention to less-frequently occurring VSO type clauses in English. Brought about by any first mentioned sentence component in German, VSO word order is caused in English by certain, semantically definable syntactic elements that initiate a clause in a prominent manner. They include the following examples taken from randomly selected daily newspapers:

1. **Adverbials of place:** "Here comes the bride." or "Out of the ruins rose a fairy tale village. But other adverbials may have the same function, as: "With the fall of the Soviet Union comes the reality of nuclear proliferation."
2. **Negations or strongly limiting adverbials of time:** "Never have I encountered something like that."
or "Under no circumstances would I do that."
or "Neither have the authorities ruled out retaliation."
3. **Adverbials of time:** Now is the time to create some semblance of order.
-Then came the word that the president was sick.
-Now, just when peace looms, comes another fanatical faction.
4. **Adjectives and adjectival phrases:** Wonderful are the works of man (but none more wonderful than man himself). -Also useful are the following booklets. -Just as interested are the American protesters.
a. **Adjectives in comparative degree:** More important is developing adequate mechanisms for preventing conflict. -More abundant than the great horned (owl) is the little screech owl.
b. **Adjectives in superlative degree:** Hardest hit were homes in north Georgia. -The most likely to commit violence are men in the age range of 21-29.
5. **Direct Quotes:** "We see that sort of thing all the time," said the mayor.
-"I have become disillusioned," said the minister.
-"Absolute political treachery,"-fumed the senator.
6. **The use of the adverbial "so" in certain semantic roles:**
a. So few are the expressions that they need not be addressed at all.
b. The issue has become critical. So says the committee chairwoman.
7. **Phrases expressing restriction:** Only four times in American history has one party held the presidency for more than 12 consecutive years.
-Rarely do I mention brand names in my column.

These examples are part of a long list of syntactic elements that may bring about verb-subject word order in English. They serve to illustrate how similar German structures can be introduced using the one's background knowledge in a conscious manner to enable the teacher candidates to help their students bridge the gap from their own language (familiar) to the target language (unfamiliar).

Conclusion

Courses in applied comparative linguistics that stress these types of cross-linguistic parallels in the native and target languages will enable future teachers to underscore their lessons with demonstrations of analogous features in their own daily active or passive usage.

Presentation of linguistic information is a pedagogic problem, but selection of historical and natural linguistic concepts which would be most beneficial to students is the realm of the linguist. The key is to select judiciously the most germane and vital aspects of linguistics, using as a springboard the native language with which prospective teachers are already familiar, first making conscious the largely subconscious knowledge of one's first language and slowly expanding it, permitting future pedagogic needs to propel the inquiry into the system of the target language. Key principles that need to become operationalized in the type of cross-linguistic teaching advocated here are a reliance on background knowledge of one's own language (as metacognitive awareness is built in a linguistics course) and the ability to work with linguistic principles that bring the native and target languages closer, thereby promoting ease of transfer and allowing language to become more accessible to learners.

As we move further from theoretical concerns toward applicability, linguistics is perceived as moving out of the realm of science and more into the realm of pedagogy—in this paper this move is viewed as desirable if not critical. The role of the linguist must be expanded to include steps on how theoretical and historical tenets can be applied to actual language teaching contexts.

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LINGUISTICS IN AMERICAN LIBRARY CLASSIFICATION SYSTEMS

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It seems as though the people who are most disturbed by the difficulty of keeping all books on the same subject together on the shelves are those whose main function it is to catalog books.

—Barclay 1968: 33

Chicago is rich in libraries. That phenomenon led to this paper: I wondered why at the University of Chicago's there is shelf after shelf of volumes labeled simply P121 ("General works" in linguistics according to the Library of Congress system), and at Northwestern's, following the Dewey Decimal System, the books on Hausa appear in three or four different places. At first all libraries had closed stacks, but by the early 1800s, libraries were becoming democratic, and schemes were being devised to organize books for the convenience of browsers. The best known of those schemes was developed by Melvil Dewey in the 1870s and 1880s; but in those years, little could be done in support of linguistics, for linguistics itself was just getting under way. The rudimentary state of the field was reflected in the earliest classifications for linguistics books; but as both disciplines matured, librarianship took little notice of linguistics, and the rudiments were rarely revised.

Ever since the first edition of the Dewey Decimal Classification (DC) in 1876, Philology has been assigned to the 400s (Fig. 1), as a main class parallel with Religion, Social Sciences, Natural Sciences, Applied Sciences, Art, Literature, and History. With its second edition of 1885, the Dewey system assumed the form and characteristics it retains to this day; and despite the growth of the tables overall from 162 pages in the second edition to 551 in the 11th edition of 1922, Philology remained at 6 (Fig. 2); the addition of 5 more pages happened in the 12th—and they consisted of nothing but listings of old-world languages—and those 11 pages were virtually unchanged through the 1044 pages of the 14th edition in 1942

Fig. 1. Dewey Decimal System, 1st ed. (1876)

PHILOLOGY.	
400 Philology.	450 Italian.
401 Philology.	451 Orthography.
402 Comparative.	452 Etymology.
403 Dictionary.	453 Dictionary.
404 Synonym.	454 Synonym.
405 Periodicals.	455 Grammar.
406 Societies.	456 Prosody.
407 Education.	457 Dialects.
408 Texts.	458 Texts.
409 History.	459 Romanish and Wallachian.
410 Comparative.	460 Spanish.
411 Orthography.	461 Orthography.
412 Etymology.	462 Etymology.
413 Dictionary.	463 Dictionary.
414 Phonology.	464 Synonym.
415 Grammar.	465 Grammar.
416 Prosody.	466 Prosody.
417 Inscriptions.	467 Dialects.
418 Texts.	468 Texts.
419 Hieroglyphics.	469 Portuguese.
420 English.	470 Latin.
421 Orthography.	471 Orthography.
422 Etymology.	472 Etymology.
423 Dictionary.	473 Dictionary.
424 Synonym.	474 Synonym.
425 Grammar.	475 Grammar.
426 Prosody.	476 Prosody.
427 Dialects.	477 Dialects.
428 Texts.	478 Texts.
429 Saxon.	479 Mediæval Latin.
430 German.	480 Greek.
431 Orthography.	481 Orthography.
432 Etymology.	482 Etymology.
433 Dictionary.	483 Dictionary.
434 Synonym.	484 Synonym.
435 Grammar.	485 Grammar.
436 Prosody.	486 Prosody.
437 Dialects.	487 Dialects.
438 Texts.	488 Texts.
439 Dutch and Low German.	489 Modern Greek.
440 French.	490 Other Languages.
441 Orthography.	491 Chinese.
442 Etymology.	492 Egyptian.
443 Dictionary.	493 Semitic.
444 Synonym.	494 Indian.
445 Grammar.	495 Iranian.
446 Prosody.	496 Celtic.
447 Dialects.	497 Slavic.
448 Texts.	498 Scandinavian.
449 Old French, Provençal.	499 Other.

490 Minor Languages.

Each language subdivided if within the 490 English.

491 Minor Indo-European.

(Includes Tocharian, German, Baltic, 490-495, and Hellenic, 496-498.) This head, 490, includes general words on the Indo-European languages, but general words on the Tocharian languages go to 495, on the Hellenic group to 496, on the Maltese group to 497, while most of the material placed under 490-499 is really Indo-European; but can also con.

- 492 Indic.
- 493 Sanskrit, Prakrit.
- 494 Pali.
- 495 Modern East Indian Languages.
- 496 Including Dravidian, which is 496.
- 497 Slavic.
- 498 Panjabi.
- 499 Hindustani, Hindi.
- 500 Bengali.
- 501 Urdu, Oriya.
- 502 Marathi.
- 503 Gujarati.
- 504 Singhalese.
- 505 Iranian.
- 506 Old Persian.
- 507 Zend. (Avestan.) Old Persian.
- 508 Pahlavi. (Parsian.)
- 509 Armenian.
- 510 Modern Persian.
- 511 Oscanic.
- 512 Kurdish.
- 513 Aghem.
- 514 Celtic.
- 515 Goidelic Group.
- 516 Irish.
- 517 Gaelic or Scotch.
- 518 Manx.
- 519 Brythonic Group.
- 520 Welsh or Cymric.
- 521 Cornish.
- 522 Armorican or Breton.
- 523 Basque.
- 524 Russian.
- 525 Ruthenian.

491.8

Other Slavonic.

South East Slavonic Group.

- 491.81 Bulgarian. (Church Slavonic)
- 491.82 Serbian.
- 491.83 Croatian.
- 491.84 Slovenian.
- 491.85 West Slavonic Group.
- 491.86 Polish.
- 491.87 Bohemian.
- 491.88 Moravian, Slovakian.
- 491.89 Sorbian.
- 491.90 Polish.
- 491.91 Lettic.
- 491.92 Old Prussian.
- 491.93 Lithuanian.
- 491.94 Latvian. (Livonian.)

492 Semitic.

Northern Group.

- 492.1 Aramaic.
- 492.2 Babylon and Naveah Cuneiform.
- 492.3 Chaldean.
- 492.4 Syriac. (Peshito.)

Central Group.

- 492.5 Hebrew.
- 492.6 Samaritan.
- 492.7 Phoenician. (Carthaginian.)

Southern Group.

- 492.8 Arabic.
- 492.9 Ethiopic. (Amharic.)
- 492.10 Himyaritic.

493 Hamitic.

- 493.1 Old Egyptian. See 493 Hittite.
- 493.2 Coptic.

494 Scythian. Ural-Altaic. Turanian.

Derivation. Tamil. Finnish. Turkish.

495 Eastern Asiatic. Chinese.

496 African.

Including 491.81, 491.82, 491.83, 491.84, 491.85, 491.86, 491.87, 491.88, 491.89, 491.90, 491.91, 491.92, 491.93, 491.94.

497 North American.

498 South American.

499 Malay-Polynesian and other.

The 499 languages is not assigned to any group, but is placed for convenience with 499.

Fig. 2 (cont.)

(Fig. 3). Thus for over 65 years, until the 15th edition of 1951, and in practice until the 16th of 1958, American libraries were expected to classify their linguistics books according to an amateur's understanding of the field as of 1885. It is thus necessary to consider the 2nd-14th edition in some detail.

The so-called standard subdivisions, seen in 401-409, remain largely as they were set up in 1876, with a few specifics added. The 410 decade is to be shared between Comparative Philology in general and Indo-European Philology as a whole. The subdivisions of the standard eight slots are given under 420 "English Philology"; they enumerate the categories an educated man who had studied English and Latin grammar would be aware of. A direction to subdivide any language by the same scheme is found at the end of the display. No changes were made in the classification scheme before the 12th edition of 1927, when the wording of quite a few of the headings was expanded, and a few numbers were added.

Now I turn to the provision for the languages of the world. In edition 2 "other" languages were changed to "minor" throughout, which remained until the 12th; Indo-European beyond the "big seven" is placed in 491. Four of the nine available positions therein are (as it were) squandered on Indic; Armenian is included within Iranian (which is in accord with the 9th edition of *Encyclopædia Britannica* of 1889), and Basque within Celtic. Russian is accorded a separate number preceding Slavonic in general. Semitic and Hamitic occupy 492 and 493; ten Semitic language

490 Other languages

Each language subdivided if weight like 490 English

491 Indo-European languages in general

Includes Teutonic, 490-491; Baltic, 490-491; and Hittite, 490-491. This list, 491, includes general works on the Indo-European group, but general works on the Teutonic languages go to 419, on the Romance group to 479, on the Hittite group to 476, while most of the material placed under 490-491 is really Indo-European, but not also seen under 490 and 419

.1 Indio

.2 Old Indic Sanskrit

.3 Sanskrit dialects Primary Prakrit

.4 Middle Indic or Prakrit per excellence

.5 Pseudo Hindu Sans. Secondary Prakrit

.6 Pali

.7 Languages of classical India of Southern India

.8 Modern East Indian languages

.9 Turkish Prakrit

.10 Including Dravidian, which is 490.5

.11 Sindhi

.12 Panjabi

.13 Hindustani Hindi

.14 Urdu, Pashto, Marathi, Dakhni, Gujarati

.15 Bengali

.16 Oriya Orissa

.17 Marathi

.18 Gujarati

.19 Sinhalese Sin

.20 Iranian

.21 Old Persian West Iranian

.22 Official language of Persia since 1901. Language of modern inscription

.23 East Iranian Zend (Avestan) Old Persian

.24 Language of the Avesta or sacred book of Zoroastrianism and the Pahlavi

.25 Pahlavi (Hawarab) Persian

.26 Persian

.27 Armenian

.28 Modern Persian Neopersian

.29 Osmotic

.30 Kurdish

.31 Afghani Pashto

.32 Other Iranian languages

.33 Baluchi

.34 Pamir languages

.35 Keltic

.36 Gaelic group

.37 Irish

.38 Gaelic or Scotch Erse

.39 Manx

.40 Languages of Isle of Man

.41 Cymric group

.42 Welsh or Cymric

.43 Cornish

.44 Breton or Bas Breton

.45 Basque

492-7

Russian

.1 Ruthenian

.2 Little Russian, Russian

.3 Other Slavic or Slavonic languages

.4 Windic. Not including Russian, that under 492-7, nor Ruthenian, that under 491-7

.5 Southeast Slavonic group

.6 Bulgarian (Church Slavonic)

.7 Serbo-Croatian Serbian

.8 Croatian

.9 Slovenian

.10 West Slavonic group

.11 Polish

.12 Bohemian Bohemian Czech

.13 Moravian

.14 Slovakian

.15 Sorbian

.16 Sorbian or Sorbian Wendish or Lusatian

.17 Polish

.18 Slavonic of the Elbe

.19 Lettic Baltic languages

.20 Old Prussian

.21 Lithuanian

.22 Lettic

.23 Other Indo-European languages

.24 Albanian

492

Semitic

.1 Northern group

.2 Aramaic

.3 Assyrian

.4 Babylonian

.5 Chaldean

.6 Syriac (Peshito)

.7 Central group

.8 Hebrew

.9 Samaritan

.10 Languages of the Palestine

.11 Phoenician

.12 Punic

.13 Carthaginian

.14 Southern group

.15 Arabic

.16 Ethiopic

.17 Ethiopian Semitic languages; literary Ethiopic; Chama; Abyssinian dialects

.18 Amharic (language of the Abyssinian court since 1200 A.D.); Tigre; Harari

.19 See also 492.3 Hamitic Ethiopian languages

.20 Hymnastic or Sabian

.21 Ancient language of Yemen and eastern Arabia; Minneh, Shama, Hadramaut, Khili

Fig. 3. Dewey Decimal System, 14th ed. (1942)

493 Hamitic

.1 Old Egyptian

.2 See 491.22 Hieroglyphic

.3 Coptic

.4 Libyan or Berber group

.5 Algerian Kabyle, Mozab, Moorish, Tamasheq or Tamasheq

.6 Hamitic Ethiopian languages

.7 Hamitic group of languages of central Africa, spoken in south of Egypt and in certain parts of Abyssinia

.8 See also 492.3 Ethiopian Semitic languages

.9 Somali

.10 Galla

.11 Dinka

.12 Languages of Sudanic

.13 Shilluk

.14 Dailali

.15 Agave

494 Scythian Ural-Altaic Turanian

.1 Except Malay-Polynesian languages that under 490

.2 Tungusic languages

.3 Tungus proper

.4 Lami

.5 Manchu

.6 Mongol languages

.7 Eastern Mongol

.8 Kalma

.9 Buriat

.10 Turkish or Tatar languages

.11 Yakut

.12 Uigurian

.13 Uigurian proper

.14 Dialectic

.15 Turkoman

.16 Nogai

.17 Kirghis

.18 Omani or Turkish proper

.19 Samoyed languages

.20 Northern branch

.21 Yurak

.22 Tungul

.23 Yoniscian Samoyed

.24 Eastern branch

.25 Samoyed-estial

.26 Kamada

names are used, but they are remarkably poorly chosen. Under Hamitic, only Egyptian and Coptic are named. Dravidian is included in 494 under Scythian/Ural-Altaic/Turanian (where Max Müller had placed it). The last five numbers are simply dedicated to continents (499, "Malayo-Polynesian and other," is followed by some pathetic remarks about Gypsies). The only changes before the 12th edition were the addition of numbers for "Sanskrit dialects, Prakrit" in the 8th and for "Canadian French, Creole, etc." in the 9th; the 11th names Catalan in the same number as Provençal, and Japanese along with Chinese.

The 12th edition includes fairly respectable expansions of 494 and 499 in considerable detail (the only "other" languages are Caucasian) and rudimentary expansions of 495 and 496 (Asia and Af-

494-5	Ugrian, Finno-Hungarian, Finno-Ugric, or Uralic languages
.31	Ugric languages
.311	Magyar Hungarian
.312	Vogul
.313	Hungro-ostiak
.32	Finnish of the Volga
.321	Cheremissian
.322	Mordvinian
.33	Permic languages Finno-Permian
.331	Permic
.332	Syrjénian
.333	Votjak
.34	Western Finnish
.341	Suomi Finnish
.342	Kardian
.343	Chadic
.344	Kirvin
.345	Bethonian
.346	Livonian
.35	Lapp
.3	Dravidian languages
.31	Tham, Tamil or Malabar languages
.311	1st group
.312	Tamil or Tamil
.313	Malayalam
.314	Teluga or Telugu Andhra
.315	Kanarese or Kannada
.316	Tulu or Tuluva
.32	Kodaga
.321	2d group
.322	Kata
.323	Toda or Toda
.324	Gond
.325	Khond or Koi
.326	Rajmahal
.327	Oraon
495	Asiatic
	Including those provided for above
.1	Chinese
.4	Tibetan
.5	Himalayan
.6	Japanese
.7	Korean
.8	Burmese
.91	Siamese
.92	Annamite
.95	Mondari family
	Language of the Kotoles
496	African
	Including those provided for above
.1	Language of Hottentots
.2	" " Bushmen
.3	" " Bantu group
	Kata dialects
.4	Negro dialects
.5	Nubian languages Language of Ponds
497	North American
498	South American
499	Malay-Polynesian and other
.1	Negrito and Papuan
.11	Negrito
.12	Papuan
.2	Malay
.21	Talala branch
.211	Philippine languages
.212	Portuguese
.213	Language of Ladrones or Mariana Islands
.214	Malagasy
	Madagascari
.22	Malay-Javanese branch
.221	Malay proper
.222	Javanese
.223	Bali
.224	Madura
.225	Sundanes
	Java
.226	Batak Sumatra
.227	Dyak
	Borneo
.228	Makassar
	Bug, Aloroe
.3	Isolated lands
.9	Other languages
.96	Caucasian
.961	Northern group
1	Lezgian group
2	Kistie or Chechense group
3	Chechense or Circassian group
.962	Southern group
1	Georgian
2	Svanetian
3	Mingrelian
4	Lazian

Fig. 3 (cont.)

rica). The incipient difficulties in Asia are obvious; Africa is even less workable.

Melvil Dewey died on December 26, 1931, about two weeks before the publication of the 13th edition; the 14th was the last carried out by his own associates, and it is the apotheosis of his own thinking. It is thus a suitable point at which to turn to another classification scheme.

The Library of Congress system (LC) as a whole was undertaken at the end of the nineteenth century, when the Library of Congress already housed perhaps a million volumes; so from the beginning it had the advantage of a huge database of materials to test possibilities on. The Linguistics schedules were published in three parts: *P-PA* in 1928, *PB-PH* in 1933, and *PJ-PM* in 1935. *Additions and Changes* are issued quarterly, and a complete cumulated edition was produced privately between 1990 and 1992.

The initial scheme of LC (Fig. 4) called for the separation of language and Fig. 4. Original synopsis of Library of Congress P (from *Class P-PA*, 1928, p. 1)

SYNOPSIS I (P-PX).

PHILOLOGY. LINGUISTIC.

P	COMPARATIVE PHILOLOGY. LINGUISTIC.
	INDO-EUROPEAN COMPARATIVE PHILOLOGY.
	EXTINCT LANGUAGES OF DOUBTFUL RELATIONSHIP.
PA	CLASSICAL PHILOLOGY AND LITERATURE.
PB	MODERN LANGUAGES. GENERAL CELTIC.
PC	ROMANIC.
PD-PF	GERMANIC.
PD	GENERAL. GOTHIC. SCANDINAVIAN.
PE	ENGLISH.
PF	DUTCH. FRIESIAN. GERMAN.
PG	SLAVIC. BALTO-SLAVIC. ALBANIAN.
PH	FINNISH. HUNGARIAN. BASQUE.
PJ-PL	ORIENTAL.
PJ	GENERAL. HANITIC. SEMITIC.
PK	INDO-IRANIAN. INDIC. ARYAN. ARMENIAN.
PL	CAUCASIAN.
PL	ALTAIC. EASTERN ASIA. OCHOKIC. AFRICA.
PM	HYPERBOREAN. INDIAN. ARTIFICIAL LANGUAGES.

LITERARY HISTORY. LITERATURE.

PN	GENERAL.
(PF)	CLASSICAL, see PA.
PO	ROMANIC.
PR	ENGLISH.
PS	AMERICAN.
PT	GERMAN. DUTCH. SCANDINAVIAN.
(PV)	SLAVIC, see PG.
(PX)	ORIENTAL, see PJ-PL.

literature within the overall class P. In the event, only Germanic and selected Romance literatures were so treated; all other literatures are filed directly after the respective language sections. Perhaps this decision was later to some extent repented of, since Russian literature was printed as a separate volume (as were medieval and modern Greek and Latin literature). An LC number traditionally comprises one or two letters plus up to four digits. (A decimal fraction has occasionally been introduced for interpolation.) Such numbers are often further subdivided using an alphabetical device. This indicates that LC is totally *enumerative*, abandoning the *hierarchical* structure of DC. This requires that the schedules be far longer than those of hierarchical systems like Dewey, but it allows for greater consistency in assigning numbers (and it should not be forgotten that LC began as and remains an enterprise of government bureaucracy, for which consistency and thoroughness are virtues in themselves).

One aspect of *synthetic* classification has been introduced into the P division of LC. A series of (originally) 16 different "Tables of Subdivisions" is provided, specified for application to individual languages (Fig. 5) according to the extent of their materials. Thus numbers have been assigned on practical rather than theoretical grounds.

I turn first to the treatment of the field of linguistics. Like all topics in LC, P begins with generalities: journals, societies, encyclopedias, and so on. Included

Fig. 5. Language Subdivision Tables in LC

Table	Range of Nos.	<i>n</i>	Examples
I	900	14	Italian, French, Spanish, Germanic, Danish, Swedish, English, Modern English, Dutch, German, Russian, Czech, Polish, Hungarian
II	500	9	Modern languages of Western Europe, Romance, Portuguese, Scandinavian, Middle English, Middle High German, Slavic, Hebrew, Sanskrit
III	200	16	Romanian, Bulgarian, Latvian, Finnish, Basque, Coptic, Persian, Japanese
IV	100	35	Vulgar Latin, Irish, Catalan, Ukrainian, Albanian, Syriac, Pali, Armenian, Turkish, Salishan, Zapotec, Cariban, Ido
V	50	21	Cornish, Sumerian, Amharic, Bengali, Pahlavi, Korean, Tibetan, Thai
VI	30	19	Gaulish, Estonian, Lapp, Mordvin, Prakrit, Marathi, Malay
VIII	10	22	Assyrian, Judeo-Persian, Aramaic, Neo-Syriac, Algonquian languages
VIIIa	10	68	Samoyedic, Judeo-Arabic, Hindi, Urdu, Sindhi, Avestan, Ossetic, Evenki, Tai languages, Tamil, Hawaiian, Nahuatl
IX	5	12	Polabian, Slovincian, South Arabian-Ancient, Micronesian languages
XI	4	36	Sardinian, Somali, Romany, Turkmen, Brahui, Bushman, Ewe, Hausa, Aleut, Cherokee, Cree, Haida, Massachusetts, Mohawk
XII	8	5+	Brazilian Portuguese, Middle Norwegian, High German dialects
XIV	4	8+	Spanish dialects, Permic, Kariri
XV	1	24+	English of West Indies islands, Eblaite, Ugaritic, Na-Dene, Chibchan
XVa	1	5+	Gurage, Hmong
XVI	1	4+	Tamazight, Caucasian languages

among these are listings for "Relation to" other fields—originally Ethnology, Psychology, and Logic, in P35, 37, and 39 respectively (the even numbers were generally left empty for future expansion). This has had the odd consequence that Psycholinguistics is the first substantive topic encountered on the shelf, even before other such preliminaries as study of the field and history of the field. Sociolinguistics has been inserted at P40. "General works on language" begin at P101 (Fig. 6), general works on Science of Language at P121. "Comparative Grammar," beginning at P201, is where all specific topics were placed—and in the logical order Phonology, Morphology, Syntax, Semantics, Lexicography, and miscellany.

Logic is also to be found in the ordering of the major groupings of languages (cf. Fig. 4), and a very sensible solution was found to the problem of little-known languages. Indo-European comes first, of course; placing general Indo-European within the bare P section perhaps recognizes its importance in the history of the field. But then "Extinct (Ancient or Medieval) Asiatic and European Languages of Disputed Relationship" are allowed to intervene at the end of P and before the classical section, PA; unfortunately Sumerian is not there with all the other obscure cuneiform languages, but is placed at the end of Assyriology within the Semitic listings. PB houses general European (again an intrusion within Indo-European) and Celtic (why Celtic?); then Romance in PC, in geographic order; for PD–PF, Fig. 6. Original published version of Library of Congress P (from *Class P–PA*, 1928, pp. 5–7)

P	PHILOLOGY. LINGUISTICS	P	PHILOLOGY. LINGUISTICS	P
101-400	Language: General works. Introductions. Philosophy. History. Comparative philology. Philosophy, psychology, origin, etc. of language. Cl. P 601-799; PF 405.		Language: General works. Introductions. Philosophy. History. Comparative philology. Comparative grammar. Phonology. Phonetics—Continued.	
101	Early works (to 1800).	221	Phonetics.	
103	1800-1860/80.		Cl. PB 77.	
105	1860/80-.		Experimental, see QC 246; QP 306.	
121	Science of language (Linguistic).	225	Spelling reform.	
123	General works. Methodology.	226	Transliteration of oriental alphabets.	
125	General special (e. g. Analogy).		For transliteration of Chinese languages, see PL 1181-1186.	
	Controversial essays, criticism, etc. Cl. P 371.		Make reference in PJ (137); PF (758); PJ (3080); PJ (6125); PK; PL.	
131	Origin.		International phonetic alphabet.	
133	Brute language.	227	Standard alphabet.	
135	Sign language.		Accent.	
	Cl. E 86. 86. (Sign language of the Indians; Children's language, see LB 1139. L3. Make reference here.	231	Vowels and diphthongs.	
(136)	Onomatopoeia.	233	Consonants.	
137	Origin of writing, see P 311.	235	Phonetics of the sentence (Sanskrit).	
(139)	Other.	240	Cl. P 810.	
141	Theory of grammar.	241	Morphology.	
151	Special parts, see P 211-321.	245	Word formation. Derivation. Suffixes, etc.	
153	Nomenclature.	251	Inflection.	
	Philosophic grammar. Universal grammar.	253	Noun. Declension.	
153	English.	255	Adjective. Comparison.	
154	French.	259	Verb. Conjugation.	
155	German.		Parts of speech (Morphology and syntax).	
157	Other.	271	Noun. Gender.	
	Comparative grammar.	273	Adjective.	
201	General works.	275	Numerals.	
	General special.	277	Article.	
203	Classification of languages.	279	Pronoun.	
	Cl. P 101-106.	281	Verb.	
(205)	Languages of certain geographical areas, see P 381.	283	Particles.	
(207)	Grammars of several languages, not belonging to any one group of cognate languages, see P 371.	284	Adverb.	
211	Writing. Origin of alphabet. History.	285	Preposition.	
213	Collections of alphabets. Specimens, etc. Cl. NK 3000-3420; 5 sso.	286	Conjunction.	
214	Special: Unidentified characters, etc.	287	Interjection.	
	Phonology. Phonetics.	291	Syntax.	
215	Periodicals. Societies. Collections.	295	Sentence. Arrangement of words.	
217	General works.	(301)	Style. Composition. Rhetoric, see FN 173-(239); PA 181; PB-PH.	
		305	Choice of words. Vocabulary.	
		311	Prosody. Metrics. Rhythmics.	

Germanic, and PG, Slavic, a chronological arrangement might be discerned (and Croatian and Serbian are given alternative distinct sets of numbers, though a unified Serbocroatian is recommended); Baltic and Albanian are at the end of PG. The Indo-European sequence is interrupted for PH, Finno-Ugrian and Basque, showing that it was considered more useful to keep the European languages together than the Indo-European ones.

But then generalia on Oriental languages at the beginning of PJ are followed not by the Oriental Indo-European languages, which are in PK, but by Hamito-Semitic: Egyptian, Berber, Cushitic, and Semitic. "Mixed Jewish dialects" were provided for after Hebrew; the section is now called "Other languages used by Jews," where only Judeo-Arabic, Judeo-Persian, and Yiddish have not been removed to their proper places as dialects. PK is called Indo-Iranian. First the classical Indic languages are given in chronological order, and then—in the sensible decision mentioned above—all the modern languages in a single alphabetical sequence, without an attempt at subgrouping. The same pattern is followed for Iranian and for Dardic. Armenian and then Caucasian are at the end of PK. PL includes Altaic (and Ural-Altaica), Japanese, Korean, Chinese, Sino-Tibetan, Karen, "Miao-Yao," Tai, Austroasiatic, Dravidian; Austronesian, Papuan, Australian; and African. Thus, surely by accident, nearly any proposal for higher-order grouping has been anticipated in the linear order of books on the shelf. In each case,

Fig. 6 (cont.)

P	PHILOLOGY. LINGUISTIC	P
	Language: General works. Introductions. Philology. History. Comparative philology—Contd.	
321	Etymology.	
325	Semantics.	
331	Comparative lexicography.	
	Collections of words, specimen texts, selections, etc. from various languages not belonging to any one particular group.	
341	Lists of words.	
347	Minor works; particular words. a. g. Gellacher, The name of God in 48 languages.	
	Specimen texts.	
351	Lord's prayer.	
352	Other Bible extracts.	
357	Miscellaneous collections.	
361	Polyglot dictionaries. Cf. FB 331; P 785.	
371	Groups of languages, not related. Prefer FA-PM, as the case may be; a. g. PJ-186 (Oriental languages); PJ 791-806 "Muhammedan" (Arabic-Persian-Turkish) languages. Make reference here.	
381	Languages of certain geographical areas. Prefer FA-PM, as the case may be; a. g. Linguistic survey of India, PK 1608. Make reference here.	
(385)	Mixed languages (Lingua Franca; Creoles, etc.), see PM 7801-7895.	
391	Atlases. Maps.	
409	Slang. Argot.	
501-769	INDO-EUROPEAN (INDO-GERMANIC) PHILOLOGY.	
501	Periodicals.	
503	Societies.	
505	Congresses.	
	Collections. Cf. P 25-28.	
511	Series of monographs; Collections of papers, etc., by various authors.	
512	Studies in honor of a particular person or institution ("Festschriften").	
513	Collected works of individual authors. Collections of words, specimen texts, etc., see P 341-357.	
518	Encyclopdias. Dictionaries.	
(519)	Bibliography, Bio-bibliography, see Z 7001-7008. Make general reference here.	

with perhaps very general geographic subgrouping, all languages are alphabetized. For Africa, a handful of "Special families" are alphabetized before the "Special languages" list, but other families are interlisted among the languages. PM, finally, includes Hyperborean, North, Central, and South American, "Mixed" including creole, and Artificial languages.

Section P as used today differs considerably from the 1928 original (Fig. 7). In many places, alphabetical lists of special topics have been inserted. Examination of the quarterly *Additions and Changes* reveals that the growth of the schedules has been very gradual. At no time was there a comprehensive revision; numbers have been assigned as books appeared that needed to be classified: the enumerative rather than hierarchical system allows this somewhat arbitrary exercise to succeed.

The half-dozen numbers in the P130s and P140s were discarded in

Fig. 7. Synopsis of Current Library of Congress Classification (1992)

P101	Language. Linguistic theory. Comparative grammar	P237	Nasality
	Philosophy, origin, etc. of language	P238	Labiality
P115	Bilingualism	P240	Phonetics of sentence (Sandhi)
P116	Origin of language	P241	Morphology
P117	Sign language. Gesture	P242	Morphemics
P118	Language acquisition	P245	Word form. Deriv. Suffixes, &c
P119	Sound symbolism	P251	Inflection
P120	Political aspects. Language policy	P253	Declension
P121	Science of language (linguistics)	P255	Comparison
P126	Methodology. Linguistic analysis	P259	Conjugation
P129	Applied linguistics	P270	Parts of speech (Morphology, syntax)
P130	Areal linguistics	P271	Noun
P132	Biolinguistics	P273	Adjective
P134	Contrastive linguistics	P275	Numerals
P138	Mathematical linguistics	P277	Article
P140	Historical linguistics	P279	Pronoun
P142	Linguistic change	P281	Verb
P143	Comparative linguistics	P283	Function words. Particles
P145	Descriptive ling. Synchronic ling.	P284	Adverb
P146	Structural ling. Saussurean ling.	P285	Preposition
P147	Prague school. Functionalism	P286	Conjunction
P148	Copenhagen school. Glossematics	P287	Interjection
P149	London school. Systemic gram.	P288	Clitics
P151	Theory of grammar	P291	Syntax
P152	Nomenclature	P295	Word order
P153	Philosophic grammar. Universal gram.	P296	Phrases
P158	Generative grammar	P297	Clauses
P159	Stratificational grammar	P298	Topic and comment (functional sentence perspective)
P160	Tagmemics	P299	Other aspects
P161	Categorial grammar	P301	Style. Composition. Rhetoric
P162	Dependency grammar	P302	Discourse analysis
P163	Case grammar	P304	Play on words
P164	Applicative grammar	P305	Vocabulary. Terminology
P165	Cognitive grammar	P306	Translating and interpreting
P201	Comparative grammar	P307	Machine translating. Data processing
P203	Classification of languages	P311	Prosody. Metrics. Rhythmics
P204	Typology. Universals	P321	Etymology
P207	Grammar of several languages, not belonging to any one group of cognate languages	P323	Names. Onomastics
		P324	Foreign elements
P211	Written communication	P325	Semantics
P215	Phonology. Phonetics	P326	Lexicology
P218	Distinctive features	P327	Lexicography
P219	Phonemics	P331	Comparative lexicography
P221	Phonetics	P341	Lists of words
P222	Intonation	P351	Specimen texts
P223	Tone	P361	Polyglot dictionaries
P224	Prosodic analysis	P365	Abbreviations. Acronyms
P226	Transliteration. Transcription	P367	Dialectology
P227	Internat. Phonetic Alphabet	P368	Standard language. Literary language
P231	Accent	P371	Groups of unrelated languages. General surveys of languages
P232	Pause. Juncture	P375	Linguistic geography
P233	Vowels and diphthongs	P391	Atlases. Maps
P235	Consonants	P408	Colloquial language
P236	Syllable. Syllabication	P409	Slang. Argot

1974 (and have not been reused), and currently useful headings have been devised both to occupy the large blank spaces thus freed up and between earlier, still useful ones. An act of quiet desperation is found between P240, Sandhi (the last topic in "Phonetics. Phonology"), and P241, Morphology: "Grammatical Categories" clearly would best be placed at the head of Morphology; so—demonstrating that LC is anything but hierarchical—it appears, starting in 1976, as P240.5–9. Various ways of doing linguistics have been comfortably accommodated, beginning in the late 1970s, in P126–165. An extreme example is found with the sequence P217.6 Generative phonology (added 1979), P217.7 Autosegmental theory (added 1986), and P217.8 Compensatory lengthening (added 1987).

The 15th through 20th editions of DC are a sad record of the power of inertia, or of tradition, even when the tradition is a bad one. We left off at World War II with a classification of Philology that was devised well before the Spanish–American War. Not until American forces were engaged in Korea was that version superseded: the 15th edition of DC was published in 1951 and met with a firestorm of criticism. The new team of editors had dared to jettison much of what they felt was detail unnecessary to the majority of their users; they had moved things around, which either necessitated much recataloguing or resulted in incongruities on the shelf; and—conceivably most upsetting to many users—they dared to reset the book in a clear, contemporary design using a modern typeface.

In Linguistics, though (the title Philology has disappeared), little changed. Some of the headings were improved, and most of the subdivisions lost. "Oriental" is mentioned under 490 "Other"; "Indo-Hittite" is added to Indo-European at 491. Yiddish is now a German dialect at 437.9, Basque is in 499.9, Hyperborean is 494.6, "Caucasic" is *added to* Dravidian at 494.8. DC15 properly moves Bushman to the Hottentot number; subdivision of 497 North America is provided for the first time, on the basis of Trager's (1945) classification. Armenian remains in 491.54.

Reaction to the intense criticism was swift. The 16th edition came out in 1958; the design was more conservative, and many of the innovations of the 15th were discarded. 400—now called "Language"—was little affected. Some of the subdivisions were restored. Armenian is still in 491.54, but at least 491.5 is renamed "Iranian and Armenian." Yiddish is back under Hebrew, at 492.49, and a new number, 492.499, is provided for "Other Jewish Languages." Caucasian is back at 499.96. Apparently the compilers were made aware of some missing languages, for 495 (East and Southeast Asia) now explicitly includes Andaman, Burushaski, Karen, Lolo, and Miao. Incredibly, Bushman is re-separated from Hottentot. The Miskito-Matagalpan stock at 497.8 is now said to include unclassified Mesoamerican languages, presumably because that used to be the number for languages of Central America and the Antilles.

The then editor of DC asserted that the 17th edition of 1965 was the truly innovative one (Custer 1968), and indeed qualitative changes are finally found in its linguistics listings, after 80 years of the original framework. Psycholinguistics is recognized, at 401.9 as a subdivision of "Philosophy and Theory," now also the home for universal languages (401.3, formerly 408.9). Hieroglyphics are moved

from "Nonverbal language" to "Notations" in 411; Phonology (414) now includes phonetic transcription; 417 Paleography changes to Dialectology and paleography—but "Paleography" is given as the definition of Historical Linguistics! (So there is now a conflict with 409 Historical and geographical treatment.) The fairly useless "Texts" at 418 is now "Usage (Applied linguistics)," encompassing translation.

Indo-European is now again assigned to 411–418 rather than 491. Similarly, the hierarchy is better observed by making Germanic languages 430 instead of 439, with 431–438 used for the description of German itself, whereas general Romance remains in 479. But Classical languages are 480. And Armenian is now 491.992! Aramaic is finally removed from 492.1, so that Akkadian can be promoted to a number of its own. Yiddish remains under Hebrew, but the "Other Jewish languages" have disappeared. The "Chad family" is named for the first time, properly under 493 "Hamitic." The most important of the Chadic languages, however, Hausa, is placed in a brand new category, "Commercial languages [of Africa]," 496.91, alongside Swahili, 496.92, which has moved out of 496.3 where Bantu used to be, which is now "Niger-Congo family." The other change in Africa is that Bushman is back with Hottentot in something called the Macro-Khoisan family. The curious combination "Himalayan and Assamese dialects" (formerly 495.5) is broken up into 495.49 "Other Tibeto-Burman" and 495.87 "Nonstandard Burmese"; Japanese and Korean still intervene. Sumerian is at last among the Other languages at 499.95, and Artificial languages now bring up the rear at 499.99.

The 18th edition of 1971 introduces a table of languages (to be used for the language of the book being catalogued, whatever its subject) and one of standard subdivisions applicable to any language number. These two new tables allow some extra concision in the Language pages. Of real changes, though, there seem to be none. Romance languages are now 440 along with French. Yiddish is now 437.947, meaning "regional variation of German in Eastern Europe." (Judeo-Spanish [Ladino] is 467.9496, "regional variation of Spanish in Balkan Peninsula.") Hausa is allowed to be a Chad language, with its own number at 493.72. Other African languages are even provided with subphyla, such as West Atlantic and Benue-Niger; there is still a category "Commercial languages," but with a note to "Class a specific language with its family."

DC19 (1979) revives 404 for "Special topics of general applicability," namely, Bilingualism (404.2). 408 goes from "Collections" to "Treatment of language among groups of persons." The only other changes are truly tiny: Cornish is revived at 491.67, Africa no longer has "commercial languages," and American "aboriginal" is changed to "native."

Finally, with the 20th edition of 1990, DC becomes aware of Semiotics, Semantics, Mathematical linguistics, and Language acquisition. Paleography is placed under writing systems so that 417.7 is reserved for Historical linguistics. The only significant change in the language list is the moving of the "miscellaneous" languages—all those not provided for elsewhere—from 499.9 to 490. This is intended to accommodate future elaboration of the schedules via (vertical) expansion rather than relocation. Sociolinguistics is excepted from 408, placed in a revamped Soci-

ology section, at 306.44, with Ethnolinguistics in 306.44089. So the current edition of the Dewey Decimal Classification provides for a few of the specialized topics on which books are published, but it makes no provision for others and remains quite unaware of such phenomena as schools of linguistics.

Among schemes devised by linguists, I have room to mention only that by George L. Trager, which appeared in 1945–46 in *Studies in Linguistics*. It is clear that Trager had not studied classification theory; his “Bibliographical Classification System for Linguistics and Languages” borrows features from both LC and DC. Unfortunately, he seems to have taken over the worst features of each.

From LC he takes the framework “P, PA–PM” followed by a sequence of digits. But his values of the letters are completely different, assigning a phylum or a region to each in a geographical sequence (Fig. 8). The numerical scheme is highly enumerative but its organization is based on Dewey’s: it is strictly decimal–hierarchical. Numbers with one, two, three, and four digits all have different classes of meanings—generalia, form divisions, topics, and languages respectively—but the assignments, particularly to the first two categories, have not been made along a single dimension. Thus 2 is “Physics of speech” but 9 is Bibliography; 10–19 is Periodicals (divided geographically) but 40–49 is “Value, scope and relations of linguistics,” divided by subject-related-to. The two-digit and especially the three-digit categories are worked out exhaustively; there is simply no room for expansion as new topics or new approaches, undreamed of in 1945, arise. The three-digit category admirably accommodates all of descriptive linguistics as it was then known; but there seems to be no place to fit any other approach.

Trager’s classification of languages (the four-digit group) is, of course, far more sophisticated than any the library world had seen before. It seems to be completely up to date. But therein lies its weakness: language classifications have not been established once for all, and it would have been a daunting task for an Africanist, say, to reorganize one’s cabinets of offprints in 1963 when Greenberg’s classification replaced the “geographical” one used here. Already nascent was Paul Benedict’s reimagining of “Austro-Tai”; but where would Trager put such a treatment? Miao and Yao are found as two members of a subgroup of Tai. Karen is a branch of Burman. These assignments are no longer considered valid, but it is not clear how the library is to reflect this. Another weakness is that little provision is made for the fact that

Fig. 8. Trager’s Language Heads (1945: 57)

PA	Indo-European
PB	Semitic and adjacent
PC	African languages
PD	Finno-Ugric; Samoyed; Turkic; Mongolic; Tunguzic; Hyperborean
PE	Caucasic
PF	Dravidian
PG	Austronesian; Papuan; Australian; Austro-Asiatic
PH	Japanese–Korean
PI	Sino-Tibetan
PJ	American Indian languages as a whole, and the languages of North and Central America
PK	South American languages
PL	Extinct unclassifiable languages of Europe and Asia and their modern descendants; Basque; Burushaski
PM	Constructed and other international auxiliary languages

some languages have generated an enormous literature, while others were lucky to get a single article describing their sound system. The Trager system might best be regarded not as a scheme for organizing a bibliography, but as a snapshot of the organization of linguistic knowledge at the end of World War II.

A fuller treatment of my topic would describe other published classification systems. None is any better than the two commonly found in the United States; nor have linguists, recently, endeavored to characterize their discipline. Two new encyclopedias—Bright 1992 and Asher and Simpson in press—and the *MLA Bibliography* are organized alphabetically with subject guides again alphabetized and not set in relation with each other. The *UNESCO Bibliography* follows a sensible subject order and would serve admirably for arranging a library. Perhaps the most imaginative organization is that of the *Encyclopædia Britannica Propædia* (1974; Part Four, Human life; Division IV, Communication and language; Section 442, Language), which was devised mainly by the late Raven McDavid around 1970. The articles covering the field were commissioned to accord with this schema. Notably, the organization of the two main articles, "Language" and "Linguistics," is quite different from the organizations used in the textbooks by their distinguished authors, respectively Robins 1971 and Lyons 1968 or 1981. The tripartite division into Language, Linguistics, and Languages of the World is innovative but apparently has not been taken up within the discipline.

The lesson of all this is well known to linguists. Libraries are not likely to own many books anywhere in the field of linguistics; perhaps DC is adequate for the thousands of libraries that use it around the world (though of the largest American libraries, only a half-dozen do so), and LC, used in most major US libraries, is continually expanded, on the basis of need, as the literature expands.

Author's note. This article is extracted from a larger study which will in due course be offered to a library science publication.

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